



**ASSESSING QUALITY  
AND SAFETY OF FOOD  
AND BEVERAGE PRODUCTS  
IN ALBANIAN PROCESSING  
ENTERPRISES**

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## Abbreviations

ALL	Albanian Lek (national currency)
ASQC	American Society for Quality Control
ASQC	American Society for Quality Control
AUT	Agricultural University of Tirana
BIP	Border Inspection Post
CARDS	Community Assistance for Restructuring and Development Support
CCP	Critical Control Point
CMD	Council of Ministers Decree
EU	European Union
FBE	Food and Beverage Enterprises
FDA	Food and Drug Administration
FEA	Faculty of Economy and Agribusiness
FMD	Food and Mouth Disease
FTA	Free Trade Agreements
FYR	Former Yugoslav Republic
GAP	Good Agriculture Practice
GDMC	General Directorate of Metrology and Calibration
GDP	Gross Domestic Product
GDS	General Directorate for the Standardization
GHP	Good Hygienic Practice
GMP	Good Manufacturing Practice
GP	Good Practices
HACCP	Hazard Analysis Critical Control Point
HEI	Hygiene and Epidemiology Institute

IFST	Institute of Food Science and Technology
INSTAT	Institute of Statistics
IMF	International Monetary Fund
ISDB	Islamic Development Bank
ISO	International Standardization Organization
MoAFCP	Ministry of Agriculture Food and Consumer Protection
OLS	Ordinary Least Square
PFD	Process Flow Diagram
PPP	Plant Protection Product
Q&S	Quality and Safety
QA	Quality Assurance
QC	Quality Control
QFD	Quality Function Development
QM	Quality Management
QMS	Quality Management Systems
R&D	Research and Development
SEED	Southeast European Enterprise Development
SPSS	Statistical Package for the Social Sciences
SSAF	Sector Strategy of Agriculture and Food
TQM	Total Quality Management
US	United States
VI	Veterinary Institute
WTO	World Trade Organization

## 1. Introduction

Quality has become a vital distinctive feature for competition in the world market food products. To obtain a good quality end product, quality is becoming increasingly managed across the whole food chain from the initial supplier of raw materials to the final consumer for consumption. Striving for quality is not a free choice. Significant factors such as consumer understanding of food quality and the ultimate concern for health and food safety all force actors in the agribusiness and food industry to use quality management as a strategic protocol in innovation and production (Luning *et al.* 2002).

Quality management is of paramount importance in all stages of agro-food production. Recently, the concept of quality management has taken an unprecedented focus in the media and global society as an effect of globalization and particularly, due to numerous food scandals. Several quality systems and norms have been developed in response to these challenges. There are two trends that have developed in the agro-food industry. On one hand, quality systems are being built into the supply chain which means strong commitments from the farmer to the traders and on the other hand, general certification standards are being introduced by economically independent firms (Luning *et al.* 2002).

Agriculture has always been the most important sector of the Albanian economy. Until Communists came into power in 1944, around 85 % of the population's main source of income was through subsistence farming. Immediately following the Communists' rise to power, they immediately started a rapid industrialization of the country and the collectivization of agriculture. Significant economic growth was achieved during the 1960s and early 1970s as a result; however, by the late 1980s, the Albanian economy began suffering from problems associated with poorly managed collective farms and state-owned companies (Civici 2003).

Since the start of its transition to a market economy in 1991, Albania has suffered a series of substantial shocks to its well being and development. Almost all agricultural land was distributed and most of the state-owned companies were shut down. The early transition period was disorderly and resulted in dramatic economic shifts. In 1992, after just one year of transition, economic output had contracted to half of the 1989 level and inflation had reached triple digits (Civici 2003). Following a period of improvement and macroeconomic stabilization from 1993-1995, the country again plunged into deep economic crisis in 1997 when rioting triggered the collapse of the financial pyramid schemes. Inflation escalated over

a period of a few months and economic activities came to a virtual standstill. Since then, Albania's per capita Gross domestic Product (GDP) has shown a steady growth; specifically, \$6316 in 2007, \$6911 in 2008, \$7168 in 2009 and \$7380 in 2010 (IMF 2010). Despite the apparent annual growth in the per capita GDP average, the annual per capita food consumption has been estimated far below the European average.

Agriculture continues to be one of the most important sectors of the national economy; however, its contribution has been decreasing over the years (estimated at 22.8 % of the GDP in 2005 and 20.5% in 2006). The rural families continue to dominate the national economy as more than 50 % of the population lives in these rural areas where agriculture is the main working alternative. To be specific, the real mean increasing rate of agriculture production during the last five years is estimated at about 3 % per year (MoAFCP 2008). Despite the achievements of the past years, Albanian agriculture and rural life remain, to a large extent, at a subsistent level. Given the importance of agriculture to Albania and its people, the Albania government needs to design policies aimed at increasing agriculture production and simulating the agro-industry sector.

In the agro-food sector, quality management is especially important for the following reasons: (a) agriculture products often perish because of physiological processes and microbiological contamination; (b) agriculture products are very heterogeneous and the quality parameters for components like sugar, size and color, which are very important for processing, have to be controlled; and (c) a large number of farms produce agricultural products at the small scale level (Luning 2002). Many different quality systems have been developed in the agro-food sector during the past ten years and will continue to do so; particularly, due to the numerous food scandals and globalization.

### **1.1 Problem statement**

The current industry of meat processing is a relatively new industry in Albania, established mainly in the last 15 years. Through exploiting all possibilities and resources, and overcoming the difficulties faced during development, the meat processing industry has always managed to satisfy the quantitative needs of the Albanian consumers.

Nowadays, the most important and delicate problem related to the meat processing industry is the quality and safety of these products (avoiding elements within the content of these products that may endanger or risk the health of the consumer). As the meat industry is beginning to prepare to introduce its products at a larger and more organized scale in the

foreign markets, particularly the European market, this problem of product quality and safety is becoming a more sensitive and prevalent issue in the meat industry.

In order for Albania to be competitive in future open markets, specifically within the EU countries, it has to achieve and surpass the minimum quality standards recognized in the food industry. A large number of enterprises within the food industry suffer due to lack of information and quality of management; as such, they need greater theoretical and practical training in this field (Kapaj 2004). Based on the fact that agriculture and the food industry sector is the largest contributor for the Albanian GDP (23% of GDP in 2008 (INSTAT 2009)), governmental policies in Albania are aiming to achieve further development and improvement within this sector.

Referring to a previous study by Kapaj (2004) the meat processing in Albania (as part of the food industry) is dominated by small-scale companies, partly industrial producers (54 well-established private companies) and over 100 others operating as artisan ham & sausage producers. The meat processing sector has noted increasing growth rates in terms of production, employment and investment; to be specific, it is one of the more emerging sectors in the agro-food processing industry reaching 15% growth per year with a current production value of over Euro 55 million. Investments in this sector have increased in the recent years mainly towards buildings and technology. Moreover, the market share of domestic sausages and ham is estimated to be over 90%, with higher import substitution norms in the recent years.

In the Albania Ministry of Agriculture Food and Consumer Protection's (MoAFCP) new strategy for agricultural sector development, it states that although Albania's meat consumption per capita is increasing, it is still lagging behind the EU levels. Albania's production is based mainly on the processing of imported raw materials, given that the livestock sector is not developed at the level to be able to supply the industrial sector with the required amount of raw materials to sustain it.

Slaughtering in Albania mainly takes places in farms and a few are located in the main cities; however, slaughterhouses by EU norms are lacking resulting in a flux of investment. Slaughtered meat in Albania is preferred to fresh meat for consumption. Still, there are many farms increasing investments in both cattle and pig production for industrial purposes due to the increasing demand of the meat processing industry. Packaging materials and equipments are also imported (MoFCP 2008).

Retail chains of main food processors are found all over the country, with Tirana being the most concentrated market due to about 30% (MoAFCP 2008) of the population living in this specific area. The sector is also strongly supported by a growing retailing market due to international brand hyper and supermarkets establishing within the country. New niche markets are developing in the food processing sector, such as frog meat where Albania is one of the main exporters to the EU, in addition to snail meat. Moreover, very good prospects in this sector are noted for poultry meat.

Under the certification process of quality management systems are a growing number of food processing enterprises. While there is a need for product certification by 90% of enterprises and a need for certification of quality and safety management systems by 70% of food processing enterprises, the readiness to invest in certification of products is expressed by 25% and certification of management system by 35% of food and beverages enterprises in Albania (MoAFCP 2008).

This research consists of identifying the level of implementation of these quality standards in the Food and Beverage Enterprises (FBE) in Albania, problems that this industry faces, and resources to identify incentive policies to support the managerial staff of enterprises in successfully implementing these quality management systems. Furthermore, policy-makers based within this scientific research may also improve their policies and make them more effective towards quality and safety of food and beverage industry.

### ***1.2 Objectives, hypotheses and research questions***

The overall purpose of this study is to examine Albania's current situation and perspectives in the food and beverage processing sector regarding product quality and safety and the implementation of quality management systems. The specific objectives of this study include: a) an investigation of the quality and safety of the food and beverage products in the Albanian processing enterprises and its respective legislation; b) an investigation of the level of implementation of Albania's quality management standards in the food industry and identification of factors that influence implementation of these standards; and c) an investigation of the effects of different factors belonging to the internal and external environment of the organization on different integrated quality management aspects (referring to ordinal logistic regression analysis) and a quantitative measurement of these effects.

Based on this study's purpose and objectives, the following hypotheses were generated:

**Hypothesis A:** The national food and beverage safety legislation is well known within the Albanian processing enterprises. Furthermore, a low number of these organizations comply with voluntary regulations and standards.

**Hypothesis B:** Food and beverage processing companies in Albania are aware of the importance of applying quality management systems for the safety of their products, as well as for certifying their products and systems in order to be competitive in the market.

**Hypotheses C:** A small number of food and beverage enterprises in Albania have applied quality management systems to assure the quality and safety of their products.

**Hypothesis D:** Information in terms of quality and safety, operational markets, employees' qualifications and collaboration between departments in organization all play a significant role in the approach of the FBE efforts to implement and certify quality management systems.

This study aims to answer the following research questions:

- What is the level of information that the FBE have regarding legislation (Albanian and international) about food/beverage products?
- What is the relation of FBE with markets and clients for issues related to quality and safety?
- What is the level of production technology in the food and beverage industry in relation to the products' quality and safety?
- To what extent is the quality and safety control of the products in food and beverage industry is realized?
- What is the level of product certification in the food and beverage industry?
- What is the level of knowledge about international quality management and quality assurance systems?
- What is the level of certification with respect to quality management and quality assurance systems?
- What is the general situation of the FBE in Albania?

### **1.3 Structure of dissertation**

The dissertation at hand is divided into seven chapters. Chapter one includes the introduction and problem statements, objectives, hypotheses and research questions.

Next, chapter two discusses the varying concepts of quality, dimensions and definitions. It continues with an overview of the Albanian agricultural sector, particularly the food and beverage sector, and includes figures to further represent the analysis of this topic. Moreover, Albania's current situation and relevant legislation regarding food quality and safety, followed by Albania's situation of animal health and plant protection, is also elaborated in this chapter. Lastly, this chapter discusses the basic quality assurance systems focusing on theoretical view, while also giving the basics about quality management and business performance.

The intention of the third chapter is to give a theoretical overview of the ISO quality management standards; particularly, on principals of the ISO series as an internationally recognized quality management systems. Descriptions about different quality management systems and importance of quality management systems in the food industry sector are given in this chapter.

Chapter four describes the methodology of this study; to be specific, theoretical concepts about the research methodology in social sciences, selection of sample, sample size and the data collection approach are explained in this chapter. Furthermore, the questionnaire design, technique of administering the survey (face to face) and the final process of analyzing the data is further discussed. The model of logistic regression is explained in a detailed stepwise manner and is followed by an explanation for using SPSS for running the model.

Chapter five includes the "Analysis and Interpretation of the Results". Therefore, for each research question generated (Section 1.2), the subsequent main findings and recommendations are given. Results of the study are drawn by using a descriptive statistical analysis and ordinal logistic regression.

Chapter six compares the findings of this study with other similar noted studies regarding this topic. The chapter closes with conclusions and recommendations developed from this study. Finally, the last chapter includes a short summary of the dissertation in English and the German language.

## **2. Theoretical Background of Quality Management**

This chapter introduces quality management within the food industry and describes different quality assurance systems. An explanation regarding the relationship between food enterprises and quality management is provided in order to show the importance of quality management systems on business performance. The research methodology used for this study to gather data in the food processing enterprises in Albania is also discussed in this chapter.

### **2.1 Different quality concepts**

In the last decade, the concept of 'quality' has become of utmost importance to society. To be specific, consumers have become more conscious about the concept of quality and organizations themselves are now being judged on their overall quality performance instead of (or in addition to) just their financial performance. The most drastic change in terms of quality thinking is most likely the shift from production-oriented to consumer-oriented concepts. Moreover, integrative approaches, system thinking, the focus on advanced technologies and belief in human capacities have also had considerable impacts on current quality management approaches (Schiefer 2002).

#### **2.1.1 Quality concept**

The described quality concepts range from simple illustrations to complex models reflecting factors that might influence quality expectations and perceptions by consumers or customers. General concepts for quality as well as specific concepts for quality perception in the food industry are summarized as follows:

##### **1. Zip model**

Van den Berg and Delsing (1999) described quality as the relationship between suppliers or companies delivering products that comply with specific expectations of the customers or consumers.

##### **2. Quality view points**

According to Evans and Lindsay (1996), the concept of quality is often confusing because people consider quality with different criteria. They distinguished five criteria: judgmental, product-based, user-based, value-based and manufacturing-based.

From a *judgmental* point, quality can be considered a synonym of excellence or superiority. From this viewpoint quality is loosely related to a comparison of product characteristics, it is (sometimes) more a quality image created by marketing. Typical examples are Rolex watches and Coca-Cola, which are considered quality products mainly due to their brand name. Of course, products must also comply with consumer demands; however, the brand in itself is almost a guarantee for quality.

From a *product-based* view, quality can be defined as a function of a specific, measurable variable. Differences in quality are thus reflected in a quantitative difference of a certain variable. Quality from this point of view is often associated with price; the higher the price, the better the product.

The *user-based* definition of quality involves the presumption that quality is determined by what a customer wants, in short 'fitness for use'.

In the *value-based* criteria, the usefulness or satisfaction can be related to the price of the product. From this point of view a quality product is one that is as useful as competing products and is sold at a lower price or one that offers greater usefulness or satisfaction at a comparable price.

The fifth criterion is the *manufacturing-based* one. For this criterion, quality can be described as the desirable outcome of engineering and manufacturing practice, or conformance to specifications. These specifications include targets with tolerances, as specified by the designers of products and services.

Evans and Lindsay (1996) suggested that a criteria used for defining quality depend on one's situation in the production-distribution cycle. Customers generally view quality from the judgmental or product-based perspective. Marketing people are focused on 'consumer needs' and often consider quality from the user-based view. The value-based definition is most useful for product designers who balance between performance and cost to meet marketing objectives. Conformance to product specifications is the major goal in production, and therefore for production personnel the manufacturing-based definition of quality is most practical.

### **2.1.2 Quality dimensions**

Several authors attempted to define factors, attributes or dimensions, which were assumed to be relevant for the quality perception of the product. Garvin (1984) defined eight principal

quality dimensions for (capital) goods. Evans and Lindsay (1996) proposed important dimensions for service quality. Although both authors use different terms, some similarities in meaning can be noticed (i.e. performance and accuracy, conformance and completeness, and serviceability and responsiveness).

Agro-food products have aspects that are very typical compared to (capital) goods and services, such as hidden safety risks, shelf life and health aspects. Moreover, consumers have a very critical and emotional attitude towards safety and quality of food. As a consequence, often very high demands are put on product quality and assurance of its production.

#### 4. Intrinsic and extrinsic quality attributes

A product has physical features that are turned into quality attributes by the perception of the consumer. With respect to agro-food products, quality perception may be affected by different types of attributes. Relevant attributes for consumers involve safety, nutritional value, sensory properties (such as taste, flavor, texture and appearance), shelf life, convenience and product reliability (correct weight, right composition, etc.). These attributes can be defined as *intrinsic* attributes and are directly related to the physical product properties. *Extrinsic* attributes refer to the production system characteristics and other aspects, such as environmental impact or marketing influence. They do not necessarily have a direct influence on physical properties but can affect acceptance of products by consumers.

#### 5. Expectation hierarchy

Van den Berg and Delsing (1999) proposed a hierarchy of expectations. Firstly, a product must be safe and not spoiled, resulting in other attributes such as taste and convenience becoming more important. This hierarchy is not static, rather dynamic, and can be different for different products.

### 2.1.3 Quality definitions

Many authors have attempted to define or describe the concept of quality. Common definitions for quality and a range of quality concepts are described below.

#### - Quality definitions

In the last two decades people have contributed to the concept of quality (i.e. quality experts or gurus). Some of them have even attempted to develop a definition for quality. Juran (1990) defined quality as “product performance that results in customer satisfaction and freedom from deficiencies, which avoids customer dissatisfaction, in short ‘fitness for use’”.

Deming (1993), another quality expert, stated “a product or a service possesses quality if it helps somebody and enjoys a good and sustainable market”. Crosby (1979) described quality as “complying with clear specifications, whereby the management is responsible for establishment of univocal specifications”.

In addition, the Institute of Food Science and Technology (IFST, 1998) has described the term quality, applied for food as follows, “When applied meaningfully to the character of food, quality may refer to the degree or standard of excellence, and/or the fitness for purpose, and/or the consistency of attainment of the specified properties of the food”.

The American National Standards Institute and the American Society for Quality Control (ASQC) standardized the definition for quality in 1987 as “the totality of features and characteristics of a product or service that bears on itself ability to satisfy given needs”.

The International Organization of Standardization (ISO 1998) within the ISO 9000 standards has defined quality as the context of “achieving sustained customer satisfaction through meeting customer needs and expectations within organizational environment commitment to continual improvement of efficiency and effectiveness”. Quality, in this sense, is critical to business success. Generally, the definitions for quality can be agreed upon as “meeting or exceeding customers’ expectations”.

## ***2.2 Food and beverage industry in Albania***

The production of processed foods is relatively new in Albania. Until the mid fifties, the agro processing industry was mainly characterized by flourmills, bakeries and milk processing lines. Agro-processing plants were mainly developed after the seventies. In the early nineties, the food-processing industry was composed of some 200 large enterprises, and more than 600 small manufacturers and approximately the same number of bakeries. Their number and diversity never responded to the agricultural development demands as well as to food demands. The agro-industry represents one of the more important directions of the Albanian economic development. As can be seen from recent statistics, the changes in food supply mainly result from achievements in the agro-processing industry, especially in some of its leading branches (MoAFCP 2008).

The Albania food-processing industry has had at least one processing facility for the cereal, meat and dairy branches in each of the country’s twenty-six administrative districts without regard to efficiency or economies of scale (MoAFCP 2005). These facilities, which employed about 25 000 people relied on the Ministry of Light Industry to allocate raw materials, arrange

transportation and market products. Years of depreciation and inadequate investment had left the 200 largest food-processing enterprises and about 750 smaller plants with obsolete, broken-down equipment. As a result, managers had little experience in obtaining materials or marketing and the plants functioned inefficiently and produced low-quality goods.

Minimal hygiene and sanitation standards went unmet. Shortages of raw materials and spare parts, along with transportation problems, forced many food-processing enterprises to curtail operations. In 1991 alone, output fell 35% from the previous year. When the government lost controls on food and vegetable prices in 1991, the official marketing network collapsed, cutting off the supply of raw materials to the country's thirty-one canneries (MoAFCP 2006).

As unofficial prices rose, supply flows to the twenty-seven state-owned slaughterhouses dried up. The thirty-two district-level and 550 villages mainly oriented in dairy production survived only by paying unofficial prices for milk and cooperating with private traders.

State-farm managers and private farmers radically reduced the amount of hectare producing oilseed, cotton and tobacco because state prices were low and there were no private markets offering higher prices. Tobacco and sugar-beet production decreased less drastically because state enterprises, including the Durres tobacco factory and the country's only sugar-beet refinery, offered farmers advanced purchase contracts at relatively attractive prices. Albania's vegetable-oil industry consisted of twenty-seven olive-oil plants capable of processing 755 tons of olives daily; eleven sunflower-oil plants with a daily capacity of 262 tons of seeds; seventeen-oil extraction plants with a daily capacity 270 tons of olive, cotton-seed, corn and sunflower pulp; and ten obsolete oil-refinery units with a daily capacity of 110 tons of sunflower oil and soya oil.

During the period from 2000-2005, the number of employees in the food industry had increased modestly. In 2005, 9 865 workers were employed by the industry, representing an increase of 9% over the year 2000. The majority of the workers are employed in bread production (34%), milk processing (11%) and beverages (10%). These areas also experienced above average growth rates within the food industry sector. The majority of enterprises within the sector may be considered as small or medium. The total investment toward the sector in 2005 was estimated to be 2.9 billion lek, which represents a more than three-fold increase over the total investment for the year 2000. The fastest growing sub-sectors over the period 2000-2005 included the dairy sector, with a tenfold increase, and grain milling, in excess of a ten-fold increase. The majority of investments in the sector have been with private capital (MoAFCP 2008).

Some figures of agro-industry sector in Albania are presented in tables below.

**Table 2-1. Structural data about the food industry sector (MoAFCP 2009)**

Nr.	Description	2000	2005	2006	2007	2008	2009
1	Number of enterprises	1844	2060	2053	2040	2117	2081
2	Number of employees	9076	9865	9995	10293	10919	10262
3	Value of products (price of 2006) Mil/ALL	27990	42790	46431	47970	51353	51693
4	Agro industry Investments Mil/ALL	898	2917	2045	3052	2063	612
	- By establishment	831	1236	1731	1457.7	1794.4	390.1
	- By budget	-	-	-	27.5	2	0.1
	- By foreign credit	50	237	0.4	48.5	0.1	1.2
	- By bank credit	17	1444	314	1518.3	266.6	220.1

**Table 2-2. Enterprises divided by number of employees (MoAFCP 2009)**

Nr.	Description	Employees				Total
		1-5	6 - 10	11 - 20	Over 20	
1	Grinding	118	0	0	0	118
2	Bread production & sweets	714	26	6	2	748
3	Fruit and vegetables processing	4	2	1	0	7
4	Alcoholic beverage	29	4	1	2	36
5	Grape production	78	5	1	2	86
6	Beer production	13	3	0	5	21

7	Oil vegetable production	106	3	0	2	111
8	Meat processing	0	1	0	0	1
9	Milk processing	296	13	13	0	322
10	Fish processing	0	0	1	4	5
11	Soft beverages and water	22	9	2	7	40
12	Others	445	60	40	0	545
	<b>Total</b>	<b>1825</b>	<b>126</b>	<b>65</b>	<b>24</b>	<b>2040</b>

**Table 2-3. Number of enterprises by activity (MoAFCP 2009)**

Nr.	Description	2000	2005	2006	2007	2008	2009
1	Meat products from butcheries	6	7	4	2	0	1
2	Meat products	62	59	57	69	75	65
3	Prepared fish products	3	3	4	4	5	5
4	Canned fruit and vegetables	16	22	26	20	22	24
5	Refined oils	67	114	125	134	110	108
6	Milk and milk products	330	387	362	344	359	342
7	Flour from cereals	406	259	272	217	194	171
8	Bread production & sweets	707	945	966	967	1084	1102
9	Biscuit production	3	14	8	14	14	17
10	Chocolate and sweets production	21	13	13	13	13	13
11	Spices and sauces production	4	8	3	6	5	2
12	Distilled alcoholic beverages	58	48	52	51	45	35
13	Wine production	22	40	31	61	69	86
14	Beer production	55	60	45	36	25	18
15	Water and soft drink production	55	38	40	54	44	39
16	Processed tobacco	7	4	2	-	-	-
17	Others	22	39	43	48	53	53

**Table 2-4. Number of employees by activity (MoAFCP 2009)**

<b>Nr.</b>	<b>Description</b>	<b>2000</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
1	Meat products from butcheries	9	13	8	58	-	8
2	Meat products	357	724	844	850	1050	959
3	Prepared fish products	428	556	653	763	782	835
4	Canned fruit and vegetables.	121	123	181	176	276	240
5	Refined oils	215	410	433	333	302	288
6	Milk and milk products	970	1126	1148	1181	1061	1131
7	Flour from cereals	989	672	942	716	648	602
8	Bread production & sweets	2875	3476	3334	3433	3902	3503
9	Biscuit production	24	188	151	176	183	271
10	Chocolate and sweets production	148	107	152	114	122	109
11	Spices and sauces production	34	165	69	33	52	38
12	Distilled alcoholic beverages	565	451	287	252	208	214
13	Wine production	118	127	173	241	314	338
14	Beer production	444	439	539	575	498	470
15	Water and soft drink production	625	644	724	959	959	818
16	Processed tobacco	881	226	129	-	-	-
17	Others	273	418	228	433	562	438
	<b>Number of employees</b>	<b>9076</b>	<b>9865</b>	<b>9995</b>	<b>10293</b>	<b>10919</b>	<b>10262</b>

**Table 2-5. Agro-Industry Production (MoAFCP 2009)**

<b>Nr.</b>	<b>Description</b>	<b>Unit</b>	<b>2000</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
1	Sausage + ham	ton	4055	9485	9824	9145	10341	8878
2	Jam + compote	ton	218	362	881	306	707	399
3	Canned vegetable	ton	105	2003	1143	807	1614	1224
4	Tomato sauce	ton	420	362	203	96	190	99
5	Oil	ton	1053	18682	21444	14789	12551	14643
6	Olive oil	ton	1875	3454	8985	3879	5634	1600
7	Milk	hl	33169	71636	61334	59027	90179	68163
8	Butter	ton	440	647	651	630	647	523
9	Cheese	ton	8404	13947	12127	12924	11818	12877
10	Yogurt	ton	5310	11739	15553	14735	8803	7311
11	Sweets production	ton	3298	8168	10491	7916	16217	9240
12	Prepared fish	ton	616	2256	1561	3449	1958	2999
13	Flour	ton	269000	305753	387794	427186	432192	435200
14	Bread	ton	198000	234151	236011	260400	250000	258652
15	Beer	hl	85837	286278	347889	365889	330250	319051
16	Wine	hl	7413	17144	15045	15279	23690	25162
17	Alco. beverages	hl	28767	30813	21070	37881	22262	21185
18	Soft drinks	hl	420448	608081	723037	692914	843254	701698
19	Mineral water	hl	386559	581492	422922	706495	653659	711612
20	Fruit juice	hl	756	34666	18923	60890	69923	56924
21	Ice cream	ton	170	552	804	1674	4156	5016

### **2.2.1 Food industry outlook**

Agro industry is a sector composed by both small and private industries that are created from the privatization of the former agro-processing state enterprises and from the new investments by private initiatives. The privatization of state agro-processing enterprises started in the year 1992, with the production of bread, flour, milk processing, alcoholic and non – alcoholic beverages. Prior to 1990, the food industry has collected and processed about 50 to 80 % of all agriculture products, as well as their marketing

During the recent years, the development of the food industry has been rapid and sustainable, and has become an important sector of the Albanian economy. The production value has reached its highest level at 48 million ALL. Beginning from the year 2001, the mean annual growth rate of this sector is over 15 %. The most important growth is evidenced in the milk and meat processing industry (MoAFCP 2009)

According to recent data, the production value of the food industry is about 19 % of the total agriculture and processed production value. In 2006, there was a total of 2 053 enterprises in food industry sector; Of this number, about 47 % are producing bread and flour, and more than 20 % are located in the Tirana region. In 2006, the bread and sweet production industry leaded with 966 enterprises or about 47 % of the total. It was followed by the milk processing industry with 362 milk processing centers, and by the flour production industry with 272 enterprises. Considering some basic standards, the agro processing enterprises are generally very small and not compliant with EU food safety standards; as such, they cannot reach the EU market. Investments and support by rural development policies are needed in order to increase the competitive capacity of the agro processing sector in Albania.

The food industry employs approximately 10 000 people and only small fluctuations in employment are observed year to year. The majority of employees are involved in bread production (about 3 330 employees, or 33% of the total), followed by milk processing units with about 1 200 employees or 11% of the total).

Again, relying on the Sector Strategy of Agriculture and Food (SSAF) for 2007-2013 from MoAFCP (2009), even in the cases of big and modern enterprises that are producing for export, the raw materials produced in the country have not the requested quality and quantity, and are not price competitive. The most representative example is the vegetable processing industry using the deep freezing technology: more than 2 000 tons of vegetables per year

(about 90 % of raw materials used by that industry) are imported from Greece, Italy and Macedonia.

The investment level is another important indicator for the sustainable development of the food industry. Investments have increased, by achieving the highest level in the year 2005 with about 2.9 billion ALL. Two main features can be observed when analyzing these investments: (1) the part of investment for technology improvement has increased from one year to another, comparing with investments for construction. It indicates that a qualitative improvement has started following the quantitative development of this industry. The technology is considerably improved having its positive effects on the whole sector development; (2) during the last years, the greatest part of investments is ensured by the local private investors themselves.

### **2.2.2 The role of the food industry in the Albanian economy**

The marketing of agricultural products and food and Albania is still in question. Provisions of the Albanian market regarding domestic products is more of a priority, without renouncing the improvement of export and taking into account that imports of products is ten times more than the exports.

Last year, data showed that export values made a significant step forward. Exports surpassed import in terms of rates, growing by 29% compared to 2005 rates (MoAFCP 2009). Exports in the region reached the highest level. Although this represents a very good sign, the export potential of domestic products is still very limited. According to the Sector Strategy of Agriculture and Food (MoAFCP 2009), the reasons for this are: (i) low production level of agriculture and agro processing sectors; (ii) lack of trading facilities (stores, processing, and packaging of products); (iii) low control level on the products quality and safety, including the veterinary control; (iv) low competition capacity of domestic agricultural products in the market because of their poor quality and relatively high production cost.

The export-import balance of food products is an important synthetic indicator for the development of the food industry. According to last year's data, the evolution of export and import is varies considerably, with a ratio of 1:8.3 in 2006 (MoAFCP 2009).

Agriculture, which represents a potential export sector, is facing many problems: high production cost of food commodities, major food safety problems, weak organization of exporters, lack of collection, storing and market facilities, a weak processing industry, administration problems related to public control and legislation on food control.

From one side, the increase in exports has not been supported by the government policy. The private entrepreneurs should also increase their competitive level in the market by identifying, (i) what is requested in the market regarding the quality of the products, the packaging, the marketing channels, (ii) which are the most effective production capacities to respond to the market demand and competition, (iii) how the competitors have resolved these problems, etc.

The importance of increasing exports is not only related to the trade balance deficit reduction, it is also essential to promote the improvement of the products quality in order to increase its domestic production capacities, increase employment, improve the prosperity and economic development of the country. The quality improvement of the products will increase the Albanian export and will reduce the import of many products that can be supplied in the market by the domestic producers. The regional Free Trade Agreements (FTA) and the Stabilization – Association Agreement with the EU offers many opportunities to the Albanian economy that can increase the export of certain products like vegetables, wine, olive oil, fish, livestock products, etc. (MoAFCP 2008).

Commerce with the EU has also grown substantially, especially with Italy, Greece, and Turkey, just to name a few. On the other hand, the trade balance of Albania with these countries still remains negative and imports in 2006 grew faster than exports. Table 2-6 shows the value of products by branches in terms of prices for the year 2006. A steady increase can be observed in the value of food products year by year.

**Table 2-6. Value of products by branches in Mil/ALL (MoAFCP 2010)**

<b>Nr.</b>	<b>Description</b>	<b>2000</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
1	Agriculture	126116	142220	147306	149802	155669	159080
2	Agro industry	27990	42790	46431	47970	51353	51619
	<b>Total</b>	<b>154106</b>	<b>185010</b>	<b>193737</b>	<b>197772</b>	<b>207022</b>	<b>210699</b>

## **2.3 The Albanian situation and quality & safety approaches in the food industry**

Food safety is an essential part of the consumer protection policy of the Albanian Ministry of Agriculture Food and Consumer Protection for the issues regarding food safety and consumer protection, which are closely related. Due to high sensitivity levels and importance for human health, these issues need a special policy and strategy in correspondence with approaches in the EU and the overall National Policy.

### **2.3.1 The Albanian situation and legislation regarding food quality and safety**

Since the early 1990s, Albania has approved legislation for veterinary, sanitary and hygiene control in the food sector. The basic legislation has been accompanied by secondary legislation (acts and regulations). The veterinary service in the MoAFCP is the competent authority for the protection of the national territory from infections coming from animals and the consumer protection from diseases coming from animals and animal products. There are 14 Border Inspection Posts (BIP) in the whole national territory. They are responsible for the control of the export / import of animals and animal products. Their infrastructure has been improved but is still not fully compliant with required standards; however, with the contribution of the Community Assistance for Restructuring and Development Support (CARDS) program it is believed that the infrastructure will improve (MoAFCP 2008).

There are 128 approved importers and processors of animal origin products in the country. On a monthly basis, the veterinary control covers the importers of animals and animal origin products, the food refrigerating stores and the producers of the foods. The food control inspectorate covers about 90 % of these points. Even if the food enterprises are improving their hygienic and sanitary conditions, only a small number satisfy the standards to export to EU countries. The drafting of a new Law on Food is a basic requirement for the development of the food industry in the country and for the introduction of the HACCP (Hazard Analysis Critical Control Point) system which can ensure a safer product.

The municipal veterinary service is responsible for the veterinarian and sanitary control of the markets and animal origin products that are in their territory. This is a dichotomy of the veterinary service that is not functioning well. The hygienic and sanitary conditions in the markets and shops are not at the required level, even if some common attempts to coordinate

controls have been made between the municipal and MoAFCP veterinary service. The food inspectorate is facing many problems; the more important problems include:

The food safety inspectorate, responsible for the control of customs in the markets, does not have the necessary equipments for sampling and for the implementation of rapid analyses. The legislation framework for the official control of the food products that are imported or locally produced, need compliance with EU legislation. The food safety inspectors do not take the necessary communication means to ensure an efficient control of food products.

The food safety structure at the regional level does not have the database for the identification, control and follow up of many problems needed during inspections of producers, storing points, traders, and importers, to name a few. There is no information exchange between different regions due to the lack of database and information network (MoAFCP 2008).

The national standards on food safety and quality are not compliant with EU standards (but there is work going on to ensure legislation on food compliance with EU standards). There also is need for the introduction of the international standards on food safety and quality, HACCP, ISO etc., to ensure a safe product to the consumer. The labeling in Albanian language of the imported food products must be enforced by the Council of Ministers Decree (CMD) No. 554, involving the necessary labeling of the imported food and beverage products. About 90 % of all food producers are controlled by the food safety inspectorate. The aim of the control is to ensure the application of the legislation as well as consumer protection.

According to the Council of Ministers Decree No. 554 “for the labeling of food products”, all approved food producers should ask the food safety department in the MoAFCP about obtaining appropriate labeling their products. About 85 % of food producers have already approved labels for their products and about 10 % are in the process of approval.

At customs, the food safety inspectorate manages the control of food products for labeling (in the Albanian language) and takes samples to make analyses. In Albania, the enforcement of CMD No. 554 regarding “the labeling of the imported foods”, has been continuous; to illustrate, about 70 % of imported foods have required labeling in the Albanian language due to CMD No. 554. It is estimated that about 90 % of the food products that are imported are regularly controlled by the food safety inspectorate in the customs, while 10% are not regularly controlled (MoAFCP 2008). The implementation of food quality and safety systems

by the producers (the auto-control) is realized by only 2 % of the producers due to the relatively high cost of this system.

### **2.3.1.1 Animal health**

Following the 1990's, the transition from big state enterprises to small private ones created favorable premises for the introduction and persistence of different pathogenic which had a negative impact on the general epidemiological situation in the country. The risk of animal and human infection from zoonotic diseases was highly increased. On the other hand, the insufficient control of animal movement has brought about a rapid increase of animal disease occurrences in the whole country. Nonetheless, Albania is free from Foot and Mouth Disease (FMD), cattle contagious pleuromonia, the small ruminant's pest, the pig's vesicular disease and the African swine fever, just to name a few. (MoAFCP 2008:9).

Some diseases that presently exist in the country (i.e. Newcastle disease, classical swine fever, cattle anaplasmosis, cattle babesiosis, anthrax, tuberculosis, cattle brucellosis, brucellosis melitensis, contagious agalaxis, varoatosis in bees, etc.) have already caused significant economic losses to farmers (MoAFCP 2008:10). Moreover, the humane infection cases from zoonotic diseases have also increased: salmonelosis about 400 cases, brucellosis about 700 cases, leishmaniasis about 100 cases and anthrax about 60 cases.

More than 30 % of the total animal population was screened for the previously mentioned infections. %the screening yielded the following results: prevalence from 0, 64 % to 5 % for brucellosis melitensis, and of 0, and 19 % for tuberculosis in animals (MoAFCP 2008:10).

Based on 2006 data for Albania, there are about 335,872 livestock farms with a total of 634,000 cattle, 2,770,000 small ruminants, 152,000 pigs, and 6,200,000 poultry. National programs are thus established for the control of animal diseases, especially for zoonotic diseases.

The Albanian veterinary budget is used for the control of diseases such as tuberculosis, brucellosis, anthrax, classical swine fever, etc. There are also national programs for the Monitoring of residues, Monitoring in aquaculture and fishery and implementation of the animal identification and registration system. About 10 % of the total veterinary budget is used for emergencies in animal diseases (such as the case of avian influenza).

### **2.3.1.2 Plant protection**

The management and control of the production in the farms that want to export their production is supported by the state for phytosanitary control. The export of plant products is accompanied by a phytosanitary certificate which is compliant with EU standards. Major records in this area include:

The establishment of protected areas has just started. This is one of the main requests for the fulfillment of the EU standards in plant production. The potential plant production export and creation of protected area for potatoes production has started in Divjaka, Albania (MoAFCP 2008:10).

The phytosanitary control of plant products has been initiated for several years now. The list of parasites to be controlled is signed by the Minister of Agriculture, Food and Consumer Protection. The cost of this control is covered by the state budget; however, the phytosanitary control is very difficult in fragmented farms.

There is a large network of importers and traders for Plant Protection Products (PPP). These products are controlled and expired products have been eliminated with EU funds. There exists a good control of all PPP importers and traders, but the internal market is not yet safe. To illustrate, the quality analyses for active ingredients are not being done, nor the residue control in plant products due to the poor infrastructure of the laboratory (MoAFCP 2008:11).

Based on MoAFCP strategy, the active substances of the PPP that are registered in Albania are all included in the EU list. All products declared by the EU to be removed from the market are immediately controlled in the internal market. On the other hand, all the commercialized PPP are first registered and have their labeling in the Albanian language.

The main problems related to the quality of the products are:

(i) There are not suitable storing and trading facilities for PPP, in respect to products safety and human health; (ii) the sector is not well equipped (especially with standard pumps). This has a negative impact for the sanitary treatment of fruit trees, wine yards, green houses, etc.; (iii) the use of chemical stimulants in plant production is at a low level, mainly in green houses and fruit trees. The technical criteria for their use are not well known; (iv) the extension service does not cover all the farmers' needs, especially for plant protection from parasites. There is a weak official structure to ensure that service, it is mostly offered by the traders of PPP. The extension service is more frequently requested by the green houses and fruit producers; (v) the level of education and training for the protection against harmful

effects of PPP is still low. The persons that use these products are not always well trained (MoAFCP 2008:11). The monitoring of residues in plant products is not carried out. The legal framework is not fulfilled as it relates to the Maximum Residue. The implementation of a complete legislation package requires greater investments to create the appropriate laboratory network. For these reasons, it can be foreseen that the application of the complete legislation package of the monitoring of residues will commence after the year 2010.

### **2.3.2 Quality control (QC)**

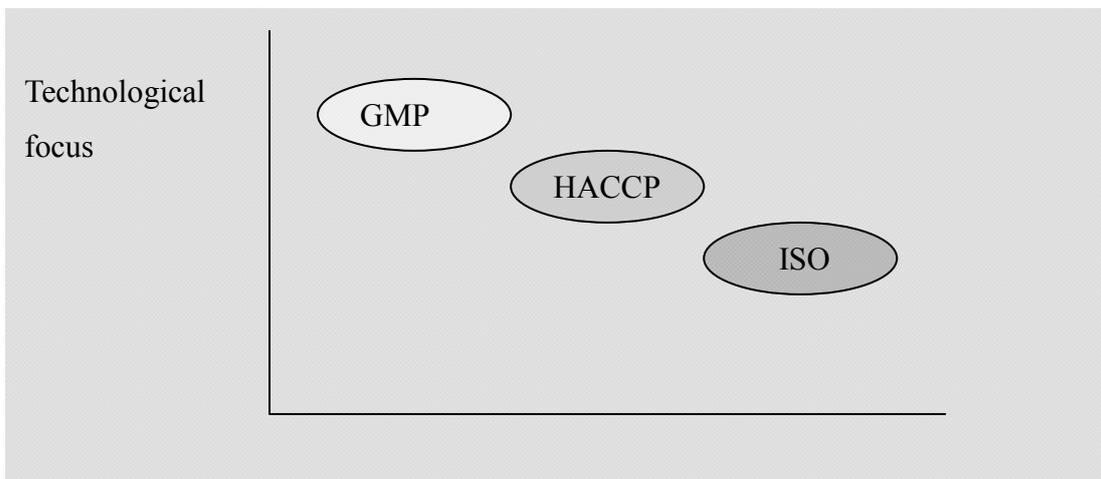
Quality control is the evaluation of a final product prior to its marketing; for example, it is based on quality checks at the end of a production chain aiming at assigning the final product to quality categories such as "high quality", "regular quality", "low quality" and "non-marketable" (Luning *et al.* 2002). As there is no way to correct production failures or upgrade the quality of the final product at the end of the production chain, the low-quality products can only be sold at lower prices and the non-marketable products have to be discarded. Their production costs, however, remain as high as those of the high and regular quality products; thus, quality control has only a limited potential to increase the quality and efficiency of a multi-step production procedure (Blaha 'SAP' 2001).

### **2.3.3 Quality assurance (QA)**

The objective of quality assurance is to guarantee that quality requirements, such as product safety, reliability, service, etc., are realized by the quality system. On the other hand, quality assurance should provide confidence to customers and consumers that quality requirements will be met (ISO 1998). A quality system is defined as the organizational structure, responsibilities, processes, procedures and resources that facilitate the achievement of quality management (NNI 1999). In recent years, there has been a market evolution in private sector approaches to managing product quality. The food industry has been moving away from the traditionally larger reactive approach, focusing on end-product testing and "fire fighting" to deal with quality problems, to a total quality approach emphasizing prevention and involvement of all personnel in improving customer satisfaction. A major quality objective is that of food safety. The set of tools for establishing food safety management systems include the "Good Practices" (i.e. Good Manufacturing Practice (GMP).) guidelines, "Hazard Analysis Critical Control Point" (HACCP) principle, and various guidelines for total quality management such as the "International Standards Organization" (ISO) 9000-2000 set of standards. These can be seen as successive steps in implementing a food safety management

system. Increasingly, these principles, particularly the HACCP approach, are being taken into account by regulatory agencies and incorporated into food safety legislation. This trend is relevant for developing countries, as they aim to satisfy customer requirements for food safety for the local and export market.

The QA-systems differ in their quality focus and approach (Hoogland *et al.* 1998). With respect to their approach, GMP and HACCP mainly focus on assurance by technological requirements, whereas ISO is more focused on management. Figure 2.1 illustrates how the common QA-systems are mapped on their technological and managerial focus.



**Figure 2-1. Common QA-systems schematically mapped on their technology and management focus (Luning *et al.* 2002)**

### 2.3.3.1 Good practices (GP)

“Good Practice” (GP) involves guidelines that are aimed to ensure minimum acceptable standards and conditions for processing and storage of products. GPs have no legal status but are often advised as basic conditions for other systems. Development of GP codes was initiated in the 60’s in anticipation of a worldwide need for clarity about safe and hygienic manufacturing procedures. GP rules and guidelines are available in three key areas of the food production process: Good Agriculture Practice (GAP) related to activities at the farm level, Good Manufacturing Practice (GMP) and Good Hygienic Practice (GHP), related to activities at the level of processing (including food handling at the final distribution stage in restaurants and shops). The most common of the three GP codes are Good Manufacturing Practice (GMP) and Good Agriculture Practice (GAP).

For quality control to be effective Good Practice must start at the primary production site; these include, proper storage of chemicals on the farm and application of chemicals, good farming practices, good harvesting practices, good storage, transportation training and record keeping.

Good Manufacturing Practice (GMP):

There is no acknowledged univocal guideline for the structure of GMP codes; however, some topics, commonly included in general GMP codes for food, are personnel, buildings, equipment and utensils, manufacturing process, storage and distribution (Luning *et al.* 2002). Additional aspects also include recovery of materials, record keeping and documentations, suppliers program, complaint and recall procedures, labeling, water supply, cleaning and disinfecting, transport and training (IFST 1991; FDA 1994). Within these topics, the following aspects are usually included in the general GMP codes:

- Appropriated qualified personnel;
- Adequate premises and space;
- Correct and adequately maintained equipment;
- Specified raw materials, packaging materials and (operations) procedures;
- Cleaning schedules and appropriate management and supervision;
- Adequate technical, administrative and maintenance support; and
- Suitable storage and transport facilities

Hygienic aspects of food production includes personnel hygiene, clean ability of equipment, utensils and buildings, use of sanitizing agents, equipment design, pest control and all kinds of protection measures against microbial, physical and/or chemical contamination. It also includes requirements for raw materials, ingredients, intermediate products and finished products like compliance to specifications, process and storage conditions (temperature, separate locations) and identification (labeling). Control and inspection with established procedures for sampling and analyses, use of accurate and checked measuring equipment with experienced staff are also prerequisites. Another aspect is keeping of records and documentation for control and traceability aims. GMP for specific food groups contains additional aspects, typical for that product. In general, it can be said that GMP codes in food production can function as a proper basis for the applications of other specific quality systems.

In terms of Good Hygiene Practice (GHP), all food handlers should have a working knowledge of personal hygiene and understand the role of food in the transmission of food borne illnesses. GHP includes: personal hygiene, product hygiene, changing rooms and facilities, protective clothing, training and record keeping.

### **2.3.4 Hazard Analysis Critical Control Point (HACCP)**

Hazard Analysis Critical Control Point (HACCP) is a system used by the food industry to ensure that all food that is consumed is safe to eat. HACCP is a systematic approach to hazard identification, assessment of risk and control. It is a structured approach for the control of food safety from the farm to the fork. The concept of HACCP was first introduced during the mid 1960s when a reliable method for manufacturing pathogen free food was required by the US space program.

The HACCP concept has been successfully applied in the control of quality, as well as safety, in low-acid canned foods in the US and many food companies in Europe. Increasingly, regulatory bodies have recognized the usefulness of this tool. Its principles have been incorporated into legislative requirements by both the EU, the General Hygiene regulations for managing food safety (93/43/EEC) and the US FDA (CFR - 123).

The HACCP approach for food safety moves away from testing of the final product; rather, it emphasizes the raw material and process control. Control is taken out of the laboratory and into the processing environment. HACCP provides a structured and systematic approach to the control of identified hazards, which may be biological (microbiological), chemical, physical or a combination of the three. A Critical Control Point (CCP) is a raw material, stage, practice or operation within the process where a hazard has been recognized and steps are in place to eliminate, prevent or reduce the possibility of the hazard occurring. There are seven principles incorporated into the HACCP system (Codex 1997):

1. Conduct a hazard analysis.

This principle involves the identification and description of the product and its intended use. Assessment of hazards and assessment of risks associated with all stages and practices are associated for both product's handling and processing.

2. Determine the CCP that will eliminate or minimize the risk.

3. Establish critical limits.

4. Establish a monitoring system to demonstrate that the CCP is under control.

5. Establish a procedure for corrective action when the CCP is seen to be moving out of control.
6. Introduce verification procedures to confirm the effectiveness of the HACCP plan.
7. Establish documentation and records to demonstrate that the HACCP system is working effectively.

Food safety has been the principal aim when applying the HACCP concept to a process. This approach was originally developed for control of microbiological hazards but it can just as easily be applied to other areas such as chemicals, contaminants and other foreign bodies. A HACCP study is carried out in three stages: 1) defining the scope of the study; 2) implementing the study; and 3) maintaining the system.

It is important to establish the scope of the study in order to determine the area to be addressed by the HACCP plan (i.e., from the farm supplier of raw materials to the retail outlet or consumer). It is also paramount that management is fully supportive of the implementation of HACCP plan, especially where investing money is concerned. The actual development of the HACCP plan is designed to be used as an aid for those responsible for implementing and maintaining a HACCP system. Its scope might cover all parts of the production/growing stage of the commodity, any subsequent handling, processing or packaging of the product, as well as distribution, catering, retail and consumer handling. The HACCP plan comprises the following stages.

### Stage 1: The HACCP team:

In order to fully understand the process and be able to identify all likely hazards and CCPs, it is important that the HACCP team consist of people from a wide range of disciplines that include backgrounds or experience such as: (i) a chairman to convene the group and to direct the work of the team ensuring that the concept is properly applied. This person must be familiar with the technique, be a good listener and allow all participants to contribute; (ii) at least one person with a detailed knowledge of the production processes (a production specialist) to draw up the initial flow diagrams; (iii) specialists with an understanding of particular hazards and associated risks (i.e., a microbiologist, a chemist, a QC manager, a process engineer); (iv) packaging specialists, raw material buyers, distribution staff or production staff who are involved with the process, and have working knowledge of it; (v) a technical secretary that can track/record the team's progress and results of the analysis; for

example, if any changes are made to composition or operational procedures, it may be necessary to alter the CCP or change methods of monitoring.

### Stage 2: Describe the product:

A full description of the product should be prepared. This should include information relevant to safety information (i.e., composition, physical/chemical structures of the raw materials and the final product, the amount of water available for microbial growth (aw), the amount of acid or alkali in the product (pH)) and any treatments that will eliminate or reduce the level of micro-organisms (i.e., heating, cooling, freezing, brining and smoking). Information regarding how the product is to be packaged, stored and transported should also be considered together with facts regarding shelf life and recommended storage temperatures; where appropriate, labeling information and an example of the label should be included.

### Stage 3: Identify the product's intended use:

How the product is intended to be used is an important consideration (i.e. is it to be cooked before eating? Consumers like to experiment with food so it is possible for food to be consumed raw, even when the manufacturer recommends cooking before consumption). All eventualities should be considered at this stage. Target groups in the population should be identified to whom the product may present a higher risk, i.e., such as the young, elderly, immune-compromised, or pregnant women.

### Stage 4: The process flow diagram:

The first function of the team is to draw up a detailed flow diagram of the process. The expertise of the production specialist is important at this stage. Processes will differ in detail in different plants, and an accurate flow diagram depends on detailed knowledge of the process.

### Stage 5: On site verification of the flow diagram:

Upon completion of the Process Flow Diagram (PFD), members of the team should visit the manufacturing area to compare what information is present on the PFD compared to what actually happens during production. This is known as "walking the line", a step by step practice to check that all information regarding materials, equipment, controls, etc., have been taken into consideration by the team during the preparation of the PFD. Aspects such as time of production, deviations caused by different shift patterns, startup, shut down, cleaning and especially night shifts should be monitored.

Stage 6: Identification of hazards and considerations of any measures required to control the identified hazards:

Effective hazard identification and risk assessment are the keys to a successful HACCP. All real or potential hazards that may occur in each ingredient and at each stage of production should be considered. Potential hazards can be identified by the following means: (i) etiological information, collected by Public Health laboratories, will provide data regarding factors known to have given rise to outbreaks of food-borne illness for particular products; (ii) technical information should be collated on all aspects of production, raw material storage and handling, processing, storage, distribution and use of the product. This should include looking at the hygienic design of the equipment and layout of the plant, hygiene and sanitation procedures in the plant, and health and hygiene of the personnel; (iii) complaints records, shelf-life and challenge testing, modeling, libraries and consultancy should also be considered.

Furthermore, analysis of hazards is ideally both qualitative and quantitative as it needs to provide useful information on the potential severity of risks. The risk expresses the chance of a hazard occurring and the severity relates to the magnitude of the hazard. The resources allocated to controlling the hazard will be dependent on these factors. Control measures may control more than one hazard and more than one control measure may be required to control a single hazard.

Stage 7: Determining the CCP:

All ingredients and each stage of the process are taken into consideration and the relevance of each identified hazard is recognized. The team must determine whether the hazard can increase at this stage or whether it can be reduced, prevented or eliminated. If the hazard can be reduced, controlled, prevented or eliminated through exerting some form of control at a particular stage, it is a CCP. The judgment and expertise of the HACCP team are the major factors in establishing the CCP. It is important that all CCPs are controlled. When deciding on the extent to which the CCP will be monitored, a judgment of risk must be made so that a level of concern can be ascribed to it. There are four levels of concern: (i) High concern - An expert judgment that without control there is a life threatening risk; (ii) Medium concern - An expert judgment that there is a threat to the consumer that must be controlled; (iii) Low concern - An expert judgment that there is little threat to the consumer. It may still be advantageous to control it; (iv) No concern - An expert judgment that there is no threat to the consumer. The points where control can be exerted, but are not critical because of low risk or

severity, need less control and monitoring. If a hazard can be controlled at more than one point, the most effective place to control it must be determined.

### Stage 8: Target levels or critical limits:

The team must next identify means by which to control the hazard at each CCP. These may include, for example, chlorine levels in wash water, temperatures during storage and use of documented procedures. All must be documented as statements or included as specifications in operating manuals. Critical limits and target values should be stated wherever appropriate.

### Stage 9: Monitoring procedures:

Monitoring is the mechanism for confirming that processing or handling procedures at each CCP are under control. The method chosen for monitoring must be able to detect any loss of control; in addition, provide information early enough for corrective action to be taken and for loss of product to be avoided or minimized. Monitoring can be carried out by observation or (although preferably continuous) by measurement on samples taken in accordance with a statistically based sampling plan. Monitoring by visual observation is basic but gives rapid results, and can therefore be acted upon quickly. It is applicable to assessment of raw materials, worker hygiene, hygiene and sanitation procedures, and processing procedures. The most common measurements taken are time, temperature and pH. For raw materials, however, tests for toxins, additives, contaminants and microbiological tests may also be requested and the supplier may be required to use HACCP procedures.

### Stage 10: Corrective action:

If monitoring indicates that criteria are not being met, or that the process is out of control, corrective action must be taken as soon as possible. The corrective action should take into account the worst case scenario, but must also be based on the assessment of hazards, risk and severity, and on the final use of the product. The specific action will depend on the process. In a fruit and vegetable processing system, this may include the re-washing of fruit and vegetables, altering the chlorine concentration of the water, or the re-cleaning of equipment. On the other hand, the traceability system must permit the containment of all potentially defective products made while the critical limit was being surpassed.

### Stage 11: Verification:

Once the HACCP plan has been drawn up, it must be reviewed before being installed and regularly reviewed once the system is operating. This might be a task of the person within the company with the responsibility for Quality Assurance (QA), (i.e., the QA Manager). The

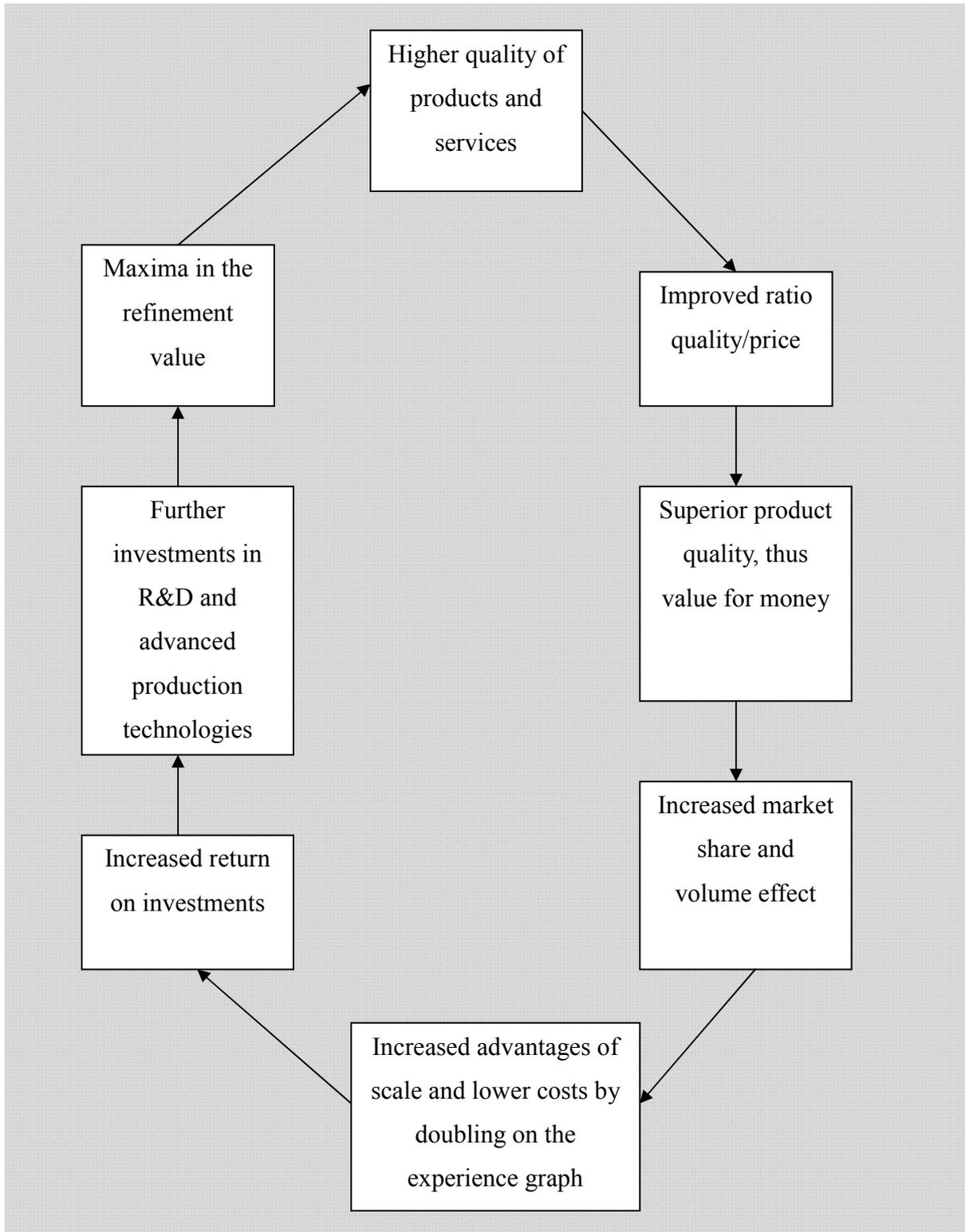
appropriateness of CCP and control criteria can thus be determined, and the extent and effectiveness of monitoring can be verified. Microbiological tests can be used to confirm that the plan is in control and the product is meeting customer specifications. A formal internal auditing plan of the system will also demonstrate an ongoing commitment by the company to keep the HACCP plan up to date, as well as represent an essential verification step. Steps in which the system can be verified include: (i) Collecting samples for analysis by a method different from the monitoring procedure; (ii) Asking questions of staff, especially CCP monitors; (iii) Observing operations at CCP; (iv) Formal audit by an independent person. It is important to remember that the HACCP system is set up for a particular formulation of a product handled and processed in a given way.

### Stage 12: Documentation:

Although not specifically required by law, record keeping is an essential part of the HACCP process. It demonstrates that the correct procedures have been followed from the beginning to the end of the process, providing product traceability. It presents a record of compliance with the limits set, and can be used to identify problem areas in the ongoing process. There will be documents recording the actual HACCP study (i.e., hazard identification and selection of critical limits), but the bulk of the documentation will be concerned with the monitoring of CCPs and corrective actions taken. Record keeping can be carried out in a number of ways, ranging from simple check-lists to records and control charts.

### **2.3.5 Quality management and business performance**

The relationship among quality, profitability and market share has been studied in depth by the Strategy Planning Institute of Cambridge, Massachusetts (United States of America). Their conclusion was unequivocal; “One factor above all others – quality – drives market share. When superior quality and large market share are both present, profitability is virtually guaranteed. In addition to profitability and market share, quality favors growth and can reduce costs. Return of investment will increase due to better productivity. Moreover, by increasing quality it is possible to drastically decrease the need for intermediate stock in logistic supply chain”. The linkages between these correlates of quality are shown in the “quality spiral” (Figure 2-2) below (Bergman and Klefsjö 1994; Ahlmann 1989).



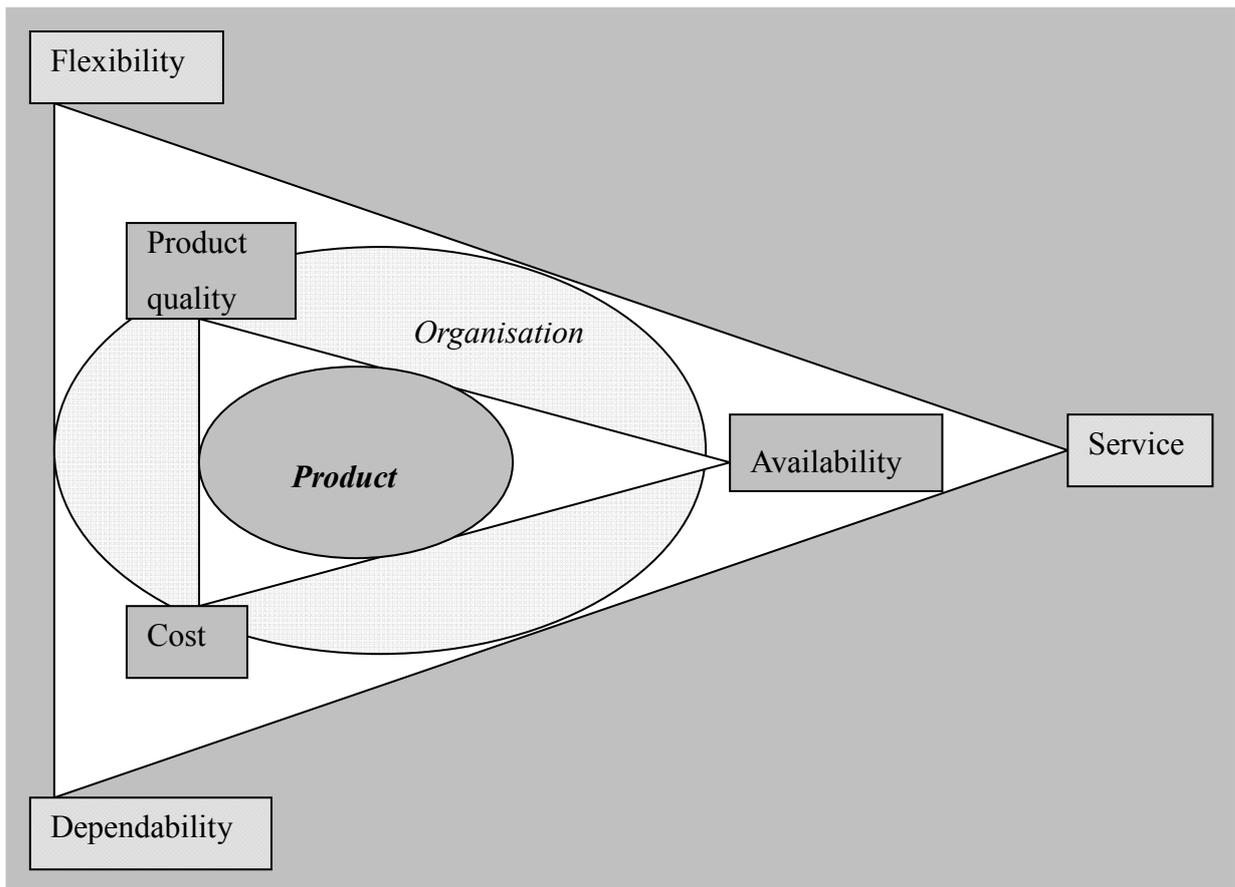
**Figure 2-2. The quality spiral illustrating long-term maximization of refinement value instead of short-term maximization of profit (Luning *et al.* 2002)**

Several research supports statements that customers are prepared to pay more for a product of higher quality than the costs required to achieve higher quality. In food production systems and food chains- quality pays. Quality does not cost extra money; it is non-quality that creates

additional costs. Costs arise when defective products are manufactured in such ways that re-work in different forms is necessary; for example, when process quality is so uncertain that special inspection has to be performed, or even worse, when recalls have to be made. In order to be one of the best, it is important to invest in quality improvements and developing new products, resulting in an increased margin of profit.

Quality has been defined in many ways; today most managers agree that the main reason to pursue quality is to satisfy customer demands. A common definition of quality from American Society for Quality Control (ASQC) is “the total of features and characteristics of a product or service that bears on its ability to satisfy given needs” (ASQC 1978). The view of quality as the satisfaction of the customer needs is often called fitness for use. In highly competitive markets, merely satisfying the needs of customers will not achieve success. In order to beat competition, organizations should exceed customers’ expectations. More progressive organization now define quality as follows, “Quality is meeting or exceeding costumers expectations”.

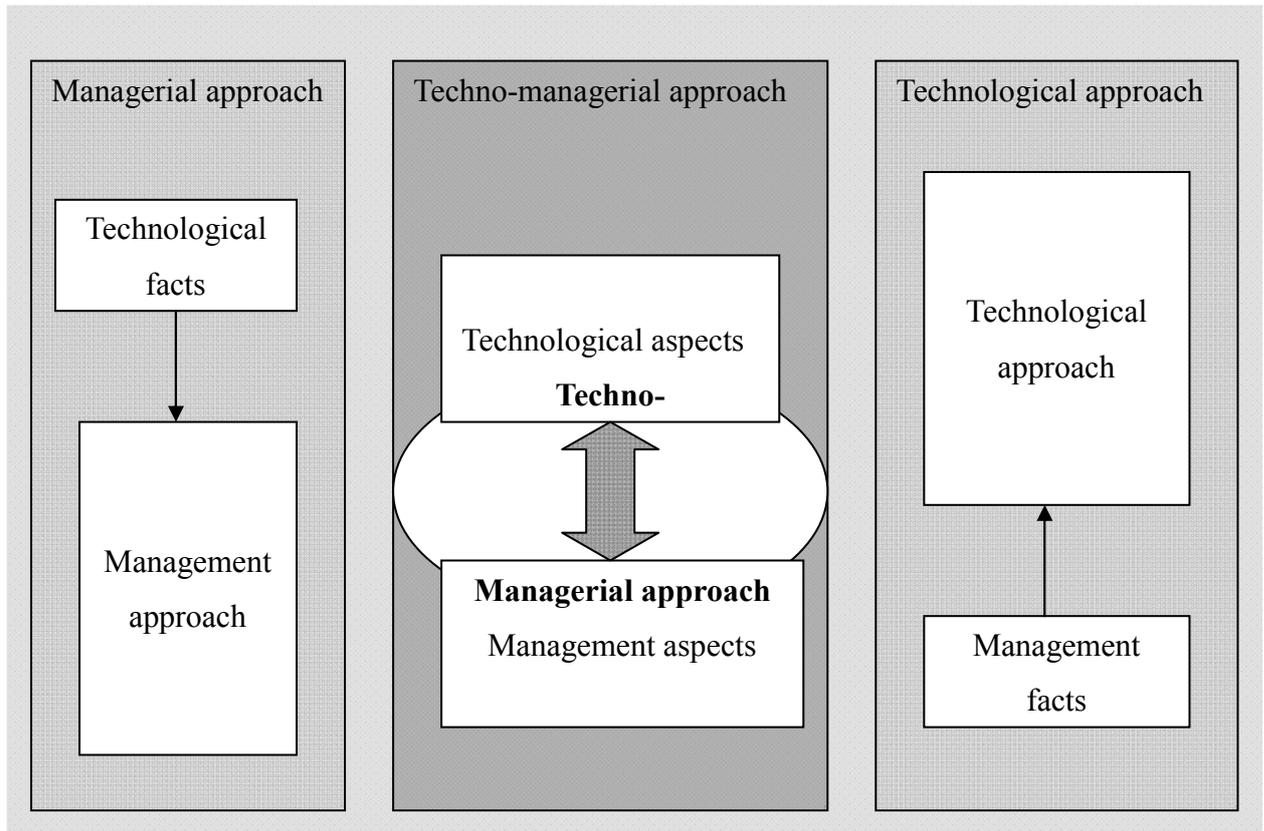
In 1887, William Cooper Proctor noted that the profitability of an organization is determined by three critical factors that subsequently create satisfaction if executed correctly: productivity, costs of operations and the quality of goods and services. These three factors have been combined in the quality triangle including product quality, cost and availability (Figure 2-3). On the other hand, in terms of business performance, quality can not only be considered as physical product quality, but rather other dimensions of competition should also be considered. In order to compensate for this addition, the quality triangle has been extended with additional factors such as flexibility, reliability and service of the organization.



**Figure 2-3. Extended quality triangle (Luning *et al.* 2002)**

The model is based in six dimensions of competition as defined by Noori and Radford (1995): quality, cost, time, flexibility, dependability and service. The extended quality triangle can be depicted as a product and organization triangle. Herein, the most restricted definition of quality only refers to product quality in a technical sense. In analyzing food, quality management is needed for both the use of physiology to understand human behavior and the use of technology to understand behavior of living materials. Of course, physiology is very important, but not the only science to be used in analyzing management problems. In management studies, there is an integrated use of (besides psychology) sociology, economics, mathematics and legal science.

As a consequence, food quality management embraces the integrated use of technological disciplines as well as the integrated use of managerial sciences. Three different approaches are possible: the managerial, the technological and the techno-managerial approach (Figure 2-4). They differ in the extent of integrated managerial and technological sciences.



**Figure 2-4. Different approaches to food quality management (Luning *et al.* 2002)**

Typical for the managerial approach is that technological aspects are contemplated as facts, “We can make everything we want to make; in fact, there are no technological restrictions” (Luning *et al.* 2002). In the traditional technological approach, management aspects are considered as boundary restrictions, “They want everything finished yesterday and never provide the appropriate budgets” (Luning *et al.* 2002). In contrast, the techno-managerial approach encompasses integration of both technological and managerial aspects from a system’s perspective. Quality problems are considered interactively from both a technological and managerial viewpoint.

In a first attempt to describe the innovation process from the techno-managerial perspective, Jongen (2000) used the DFE concept as a simplified approach that uses three questions in a specific order to put both managerial and technological aspects in the right perspective. The first question is that of the Desirability (D): which product concepts for which markets should be developed. The second question deals with the Feasibility (F) of the concepts: technological capabilities are required to make the product. Do we have them or do they have to be developed? The third and final question is that of the Effectiveness (E): how do we organize the production process from a chain perspective in order to be cost-effective?

A good example of techno-managerial thinking is the HACCP-system, wherein critical technological hazards are controlled by human control and monitoring systems, and Quality Function Development (QFD), wherein consumers' wishes are translated into technological requirements through intensive and organized collaboration of different departments in the company. Figure 2-5 shows how the techno-managerial approach resulted in the food quality management model. The model includes the organization in its environment, wherein management and technology interact, striving for product quality that meets or exceeds customer expectations. The technology is perceived as a technological system with complex interactions fulfilling different functions, in order to meet product quality requirements. On the other hand, management is perceived as a management system with complex interactions fulfilling different functions in order to activate the technological system. This allows it to give it the right direction and ensure that it meets customer expectations.

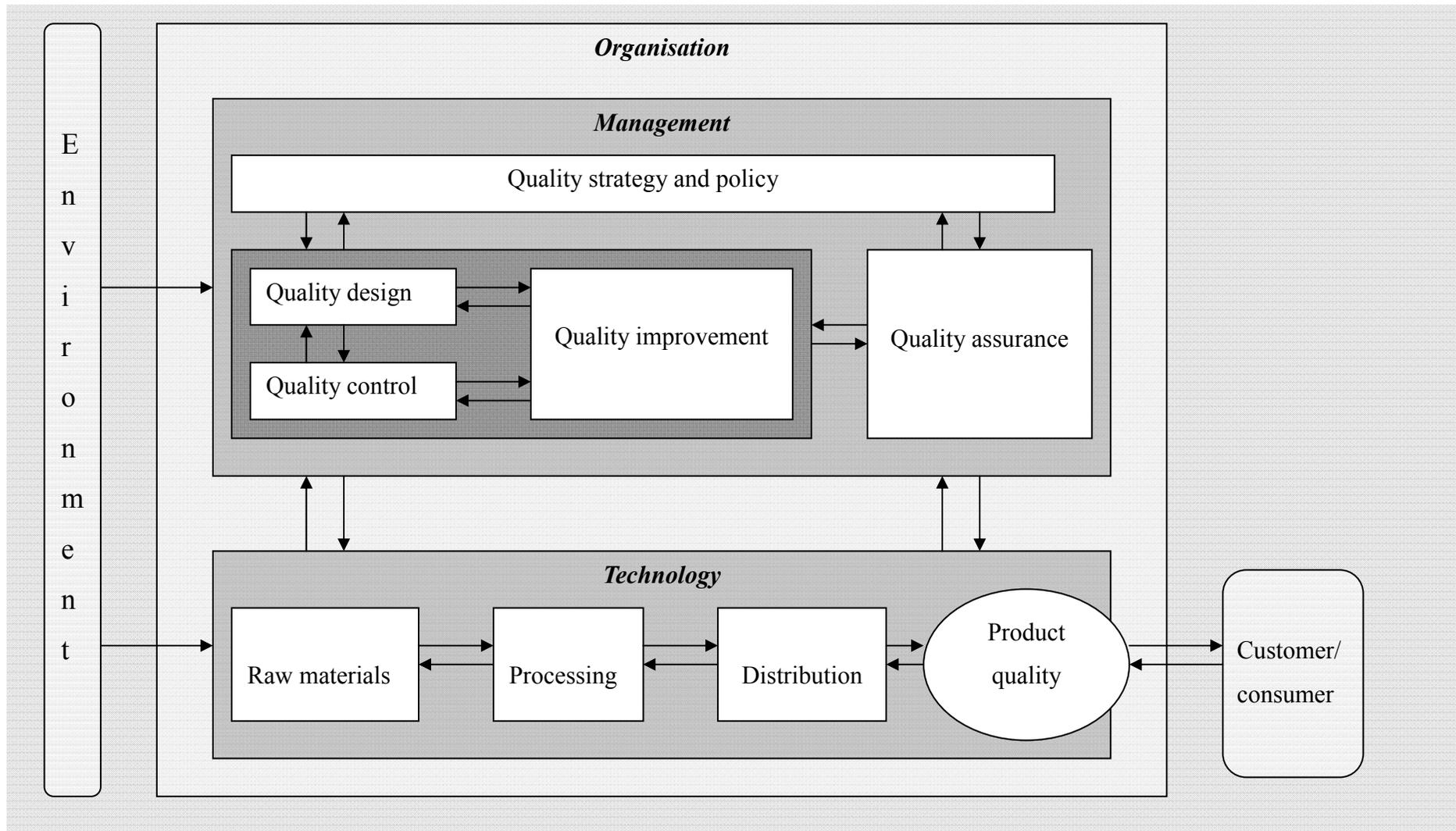


Figure 2-5. Food quality management model (Luning et al. 2002)

### **3. International Organization for Standardization (ISO) Quality Management Approaches**

ISO develops voluntary technical standards which add value to all types of business operations. It is established in all regions of the world and has a membership of 158 national standards institutes from countries both large and small and industrialized and developing. It contributes to the dissemination of technology and encourages good business practice. It supports the development, manufacturing and supply of more efficient, safer and cleaner products and services. ISO makes trade between countries easier and fairer.

#### **3.1.1 ISO and International standardization**

ISO standards safeguard users and consumers by making many aspects of their lives simpler; to be specific, ISO develops only those standards that are required by the market. This work is carried out by experts coming from the industrial, technical and business sectors which have asked for the standard, and which subsequently put them to use. These experts may be joined by others with relevant knowledge, such as representatives of government agencies, consumer organizations, academia and testing laboratories. Under International Standards, ISO standards represent an international consensus on state of the art technology in terms of good practice (ISO 9000 family).

The ISO 9000 family of international quality management standards and guidelines has earned a global reputation as a basis for establishing effective and efficient quality management systems. The need for International Standards is very important as more organizations operate in the global economy by selling or buying products and services from sources outside of their domestic market.

#### **3.1.2 ISO 9001 – quality management**

ISO standards are international standards in order to achieve uniformity and to prevent technical barriers to trade throughout the world. The essence of ISO-based quality system is that all activities and handling must be established in procedures, which must be followed by ensuring clear assignment of responsibilities and authority. ISO standards are voluntary, unless the business sector makes them a market requirement or a government issues regulations making their use obligatory. The main part of the adopted standards is concerned with health, safety and/or environmental aspects.

The most commonly used and well known of all ISO standards is the ISO 9000 series for quality. The ISO 9000 series consists of two major groups; standards for *internal* and for *external* quality assurance.

Internal quality assurance is focused on improving efficiency as well as the quality of products and/or services within the organization. For these purposes, the standards of the ISO 9004:1994 type was recommended. These standards provide guidelines for the development and implementation of quality management.

External quality assurance is focused on assuring customers that the products or services meet the required specifications. For these purposes, the three ‘certifications’ standards ISO 9001, ISO 9002 and ISO 9003 may be applied. In these standards, specific quality system requirements are described that cover topics ranging from management responsibilities to inspection.

### **Principle of original ISO 9000 series**

The international standards specified quality system requirements that could be used when a contract between two parties required the demonstration that the supplier was capable to prevent non-conformity at all relevant stages of that supplier (Stanly 1998). The original ISO 9000 family was based on the principle “write down what you are doing”, ”do what you described” and ”prove that you did what you described” (ISO 1994). The main difference between the three standards is the scope of the standards. ISO 9001 represented the standards regarding quality assurance for companies involved in the processes design/development, production, and installation and servicing; ISO 9002 represented the standards for quality assurance in the processes production, installation and servicing; ISO 9003 represented the standards for quality assurance in the processes final inspection and tests. The original 9001 series included twenty topics, for which procedures has to be established. The topics are briefly described as follows: the supplier is told that: a quality policy must be defined; to be specific, the organization responsibility, authority and interrelationship affecting quality must be defined. Next, a management representative must be appointed which has the authority and the responsibility for ensuring that requirements of ISO are implemented and maintained.

2. *Quality system*: the supplier is required to establish and maintain a document quality system to ensure that products conform to the specified requirements.

3. *Contract review*: the supplier must establish and maintain procedures for contract review and co-ordination of these activities. This is to ensure that requirements are adequately defined.
4. *Design control*: the supplier must establish and maintain procedures to control and verify the product design in order to ensure that specified requirements are met.
5. *Document control*: suppliers are told to establish and maintain procedures to control all documents and data related to requirements of the ISO standards.
6. *Purchasing*: the supplier must ensure that purchased products and materials conform to specified requirements. Sub-contractors must be selected based on their ability to meet requirements and purchased data must be clearly documented.
7. *Purchaser supplied product*: the supplier must establish and maintain procedures for verification, storage and maintenance of purchaser supplied products, damaged products or other unsuitable products that must also be recorded and reported to the purchaser.
8. *Product identification and traceability*: the supplier must establish and maintain procedures for identification of products during all stages of production, delivery and installation.
9. *Process control*: the supplier must identify and plan the production that directly affects the quality to ensure that these processes are carried out under controlled conditions.
10. *Inspection and testing*: includes the receiving, in-process and final inspection and testing of the product. Suppliers must also establish and document procedures to ensure conformance to specifications.
11. *Inspection*: includes measuring and testing the equipment. The supplier must control, calibrate and maintain inspection, measuring and test equipment.
12. *Inspection and test status*: the supplier must ensure that the inspection and test status of the product is identified by using markings, authorized stamps, tags, routing cards, inspection records, test software, etc.
13. *Non-conformity review and disposition*: the supplier must define responsibilities for review and authority for disposition of non-conforming products. Non-conformance products may be reworked, accepted by concession, re-graded or rejected.
14. *Corrective action*: the supplier must establish and maintain procedures with respect to corrective actions; for example, procedures for investigating cause of non-conformance and corrective actions needed to prevent recurrence.

15. *Handling, storage, packaging and delivery*: suppliers are told to establish, document and maintain procedures for handling, storage packaging and delivery of products.

16. *Quality records*: the supplier must establish and maintain procedures for identification, collection, indexing, filing, storage, maintenance and disposition of quality records.

17. *Internal quality audits*: the supplier must carry out a comprehensive system of planned and documented internal quality audits to verify that the quality activities comply with planned arrangements. Effectiveness of the overall quality system must also be determined.

18. *Training*: the supplier must establish and maintain procedures for the identification of training needs and provide training for all employees that are involved in quality related activities.

19. *Servicing*: where it is specified in the contract, the supplier must establish and maintain procedures for performing and verifying that service meet specified requirements.

20. *Statistical techniques*: the supplier must establish and maintain procedures for the identification of appropriate statistical techniques needed for verifying the acceptability of process capabilities and product characteristics.

Where these series (ISO 9001-9003) were intended to provide external assurance, the ISO 9004 was aimed at providing internal assurance. ISO 9004 provided guidelines for development of a quality management system. According to the ISO 9004 series, the primary objective of a company should be the quality of its products and/or services. In order to meet these objectives, the company must organize itself in such a way that all technical, administrative and human factors that can influence quality are controlled.

## 4. Research Methodology

This chapter will explain the methodology used for conducting this research and the model chosen for statistical analyses. First, the rationale behind theory and empirics will be discussed, followed by the reasons and justification for choosing the model. The questionnaire design is also explained in detail, accompanied by a detailed description of the sample selection procedure used. At the end of this chapter, the statistical analyses used for analyzing the data are described with a special focus on regression analysis and the logistic regression model. The theoretical background behind logistic regression and ordinal regression function will be elaborated in detail.

### 4.1 Theoretical background

The principle of empiricism assumes that there are basic perceptions upon which scientific theories and constructions are based. Paul S. Maxim noted that the elementary experiences are the basic elements of our constructional system and from this basis we wish to construct all other objects of pre scientific and scientific knowledge (Maxim 1999:6). Maxim stated also that “what is known as theory in the social sciences varies considerably from one discipline to the next.....and in much psychology and economic sciences; the term ‘theory’ most often connote a highly specific entity, often represented as a symbolic calculus (model)” (Maxim 1999:7). Maxim argues again that while less appealing, this type of theory is valued for its clarity, specificity and parsimony of expression (Maxim 1999:26). There are many arguments about definitions of theories among the scientific community. According to Maxim, *“Intuitively, theories are sets of verbal statements that synthesize the behavior of empirical systems. Depending upon one’s point of view, theories either describe the behavior of empirical systems or provide sufficient explanation to allow us to understand why those systems behave as they do. Wherever one stands on this matter, the adequacy of either description or explanation involves the ability to make successful predictions”* (Maxim 1999:26).

Giere (1989) suggested the following definition of theory. “We understand theory as comprising two elements, 1) a population of models, and 2) various hypotheses linking those models with systems in the real world” (Giere 1989:377-384). He continues to elaborate his second point by concluding that the links between models and the real world are nothing like

the correspondence rules linking terms with things or terms with other terms. Rather, they are again relations of similarity between a whole model and some real system. A real system is identified as being similar to one of the models (Giere 1989, 377-384; Maxim 1999:27).

Shoemaker (2004) argues about theories and science stating that, “Science tries explicitly to state its theories, to pose them in formal ways using precise statements so that it is clear what they are saying, to test them and to confirm, modify or discard them. Science is the ongoing business of coming up with new ideas and finding ways to challenge them. This notion of testing and revising is what separates scientific theories from the informality that characterize informal theories” (Shoemaker *et al.* 2004:6).

At the most general level, the word ‘method’ means **epistemology**, or the **study of how we know things**. It is about strategic choices, like whether or not to do participant observation field work, dig up information from libraries and archives, or run an experiment (Bernard 2000:8). Russell further elaborates on his ideas about epistemology and defines several key questions. According to him, one question (strategic choice) is whether you subscribe to **rationalism** or **empiricism**. **Rationalism** is the idea that human beings achieve knowledge through their capacity to reason. The competing epistemology is **empiricism**. For empiricists, the only knowledge that human beings acquire is from sensory experience (Bernard 2000:9). Another key question to consider is whether you agree with the assumptions of the scientific method, often called **positivism** in the social sciences, or favor the competing method often called **humanism** or **interpretivism** (Bernard 2000:8).

According to Russell, modern science has its roots in the empiricists of the French and Scottish Enlightenment periods. The early empiricists of the period, like David Hume, looked outside the human mind to human behavior and experience, in order to explore human differences. They made the idea of a mechanistic science of humanity as plausible as the idea of mechanistic science of other natural phenomena (Bernard 2000).

The person most responsible for laying out a program of mechanistic social science was Auguste Comte. In 1824, he wrote: “I believe that I shall succeed in having it recognized that there are laws as well defined for development of the human species as for the fall of stone” (Bernard 2000:14). Russell reported that Comte wanted to call the new positivistic science of humanity ‘social physiology’ but Saint-Simon (the originator of the so-called positivist school of social science) had already used that term. Comte tried again with the term ‘social physics’ but apparently dropped it when he discovered that the Belgian astronomer Quételet, a committed social reformer, was using the term with his book *Social Physics*. Despite

Comtes's extreme tendencies (he advocated burning the majority of books except for a hundred or so of the ones that people needed in order to become the best educated), the idea that the scientific method was the surest way to produce effective knowledge (knowledge for control of events) and that effective knowledge could be used to bring about social reform and the improvement of human lives, he captured the imagination of many scholars. These were terrific ideas in the mid-nineteenth century and they have not lost any of their luster since. (Bernard 2000:16).

Maxim summarized the status of theory in the social sciences when he said, "Many social scientists, and especially quantitatively oriented researchers have opted for a much narrower definition of theory, while others have abandoned the term entirely." He continues by saying "Instead, these people have generally opted for the term model to describe their theory statements, and they speak of model construction or model formalization when referring to their attempts at theory construction" (Maxim 1999:27).

Whether or not to conduct a questionnaire for research, do content analysis or run an experiment, the first thing that must be done is describe a process or investigate a relationship among some form of variables in the population. On the other hand, it cannot develop a research design or framework until a research question is chosen (Bernard 2000:74). Moreover, as theory is crucial to the research question it is important to have a theoretical background before developing a research question and administering the survey. Theories become useful when linguistic terms and relations cover classes of empirical events and relationships. A good way to understand what theory is about is to pick a phenomenon that begs to be explained and to look at competing explanations for it. This research is based upon different theoretical approaches which are elaborated in detail in the following subsection.

#### **4.1.1 Theoretical approach of this research**

In general, the current theoretical approach in economic theory is based on new Institutional Economics, which at times is also referred to as the New Theory of Organization. According to Furubotn and Richter (2005:2), the following concepts and hypotheses are particularly relevant in modern institutional economics.

- *Methodological individualism*: This emphasizes that people are different and have varied tastes, goals, purposes and ideas.

- a) *The maximad*: Individuals are assumed to seek their own interests as they perceive them and to maximize utility subject to the constraints established by the existing institutional structure
- b) *Individual rationality*: this can be derived into *perfect individual rationality*, where the assumption is that all decision makers possess consistent and stable preferences and *imperfect individual rationality*, where the preferences of the decision makers are recognized as incomplete and subject to change over time.
  - *Opportunistic behavior*: Organizations and employees are opportunistic
  - *Transaction cost, property rights and contractual relations* constitute basic elements in the literature of New Institution Economics (Furubotn and Richter 2005:30).

**Transaction costs** arise in connection with the exchange process, and they affect the ways in which the economic activity is carried out. **Property right** is the economic system which defines the positions of individuals with respect to the utilization of resources. Incentives and human behavior are also included in studying the impact of property rights on economic outcome. **Economic theory of contracts** deals with both transaction cost economics and property rights analysis, with incentives and asymmetric information problems.

*Principal- agent theory* in economics treats the difficulties that arise under conditions of incomplete and asymmetric information when a principal hires an agent. For instance, problems may arise from the fact that the two may not have the same interests, while the principal is, presumably, hiring the agent to pursue the interests of the former. In our study the principal is the organization and the agent is the employee. *The incentive theory of motivation* is a reward, tangible or intangible and it is presented after the occurrence of an action (i.e. behavior) with the intent of enforcing the behavior. This is done by associating positive meaning with the behavior. *Decision theory* is concerned with identifying the values, uncertainties and other issues relevant to a given decision. It has to deal with rationalism, which was elaborated above.

This study pursues these new approaches of the modern Institutional Economics Theory, with the following logic: Agribusiness enterprises in Albania and their employees are rational and opportunistic in pursuing their individual goals and aims. These enterprises pursue those goals of profit maximization and the employees (specifically to the respondents of the interviews) follow them. It was assumed that the respondent does not have complete information regarding quality management and safety in their respective organization, but that the respondent is the person with the highest level of knowledge with respect to this topic. The

respondents don't have the ambiguity regarding quality management in the organization (fully understand quality management concepts), which lead us to a correct answer of the questionnaire. It was also assumed that the employees (agents) are motivated by the principal (organization) in their every day job with respect to their own interests and goals. Taking into consideration the theoretical approach elaborated above, the following hypotheses for testing was developed.

**Hypothesis A:** The national food and beverage safety legislation is well known within Albanian processing enterprises. Furthermore, a low number of these organizations comply with voluntary regulations and standards. (Related to section B in the questionnaire)

**Hypothesis B:** Food and beverage processing companies in Albania are aware of the importance of applying quality management systems for the safety of their products, as well as for certifying their product and system in order to be competitive in the market. (Related to section C in the questionnaire)

**Hypotheses C:** A small number of food and beverage enterprises in Albania have applied quality management systems to assure quality and safety of the product. (Related to section D and E in the questionnaire)

**Hypothesis D:** Information in terms of quality and safety, operational markets, employee's qualification, collaboration between departments in terms of organization, all play a significant role in the attitude of FBE to implement and certify quality management systems. (Related to section D and E in the questionnaire)

## **4.2 Methodological approach**

Regarding the methodological aspects of empirics found in this research, the following subsections describe in detail the population selection, sample selection and procedure of data selection. Furthermore, the relevant statistical methods for data analysis, the reasons for model selection, interpretation of model findings and the computer based statistical software used for conducting the analysis are discussed.

#### **4.2.1 Theoretical approach and selection of interview method within the survey**

According to Earl Babbie, science is an enterprises dedicated to “find out” (Babbie 2007:87). He argues that “It does not matter what we want to find out, there will likely be a great many ways of doing it. Social research can serve many purposes, but three of the most common and useful purposes are *exploration, description and explanation*. Any given study can have more than one of these purposes (Babbie 2007:87).

Babbie elaborated on the details of the three purposes of social research: 1) *Exploration* sometimes is pursued through use of focus groups or guided small group discussion. This technique is frequently used in market research; 2) *Description* is used as a major purpose of many social scientific studies for describing situations and events. The researcher observes and then describes what was observed; and 3) *Explanation* is used to explain things. Descriptive studies answer questions of what, where, when and how while explanatory studies’ question is why.

In the following study, all three purposes are used to investigate the environment in the food and beverage industry in Albania regarding quality management systems.

The mode of observation for research differs from one form of science to the other. Experimental modes of observation are usually thought of in connection with the physical sciences, and certainly experiments are more appropriate for some topics and research than others. Experiments are especially well suited to research projects involving relatively limited and well-defined concepts and propositions (Babbie 2007:221).

Surveys are widely accepted as a key tool for conducting and applying basic social science research methodology (Rousseau 2003). They are used to obtain data from individuals about themselves and their households, or about the institutions or enterprises they represent. Sample surveys are an important tool for collecting and analyzing information from selected individuals, such as the enterprise representatives we surveyed.

Nonetheless, despite the different terminology used for describing the survey research, experts agree that survey research is the best method available to the social researcher interested in collecting original data for describing a population too large to observe directly. Babbie stated, “Today, survey research is a frequently used mode of observation in the social science. In a typical survey, the researcher selects a sample of respondents and administers a standardized questionnaire to them” (Babbie 2007:244). Survey methods can also be used for

other units of analysis, such as groups or interactions; some individual persons must serve as **respondent** or informants. (Babbie 2007:244).

According to Barbbie (2007), surveys include the use of a questionnaire, an instrument specifically designed to elicit information that will be useful for analysis (Babbie 2007:245). There are three main methods of administering a survey questionnaire to a sample of respondents: self-administered mail or internet-based survey questionnaires, in which respondents are asked to complete the questionnaire either themselves; through a face to face interview; or by telephone (Babbie 2007:257).

Utilizing a mail questionnaire in Albania would be very difficult. The problem lies in the quality of mailing service within Albania. Although it may be possible in the Tirana district, where mail service is more reliable and functional, such service does not extend to the rest of the territory. In addition, Albania's address system is not yet fully consolidated and it can be difficult to find the correct address for select enterprises, especially those on the peripheries of cities.

Internet-based questionnaires would also prove to be difficult in Albania. This method may be feasible for some medium and large scale enterprises in which internet and e-mail services are used and for which e-mail addresses are obtainable. On the other hand, e-mail questionnaires in Albania may also be ineffective due to insufficient network coverage and lack of communication abilities via e-mail.

Consequently, the majority of small enterprises do not use the internet or e-mail at all, rendering this type of survey impossible. According to MoAFCP database, only around 20% of registered enterprises registered have an e-mail account (MoAFCP 2008). Choosing this mode of observation would result in unrepresentative outcomes for the food industry in Albania as the data would be represent only medium and large enterprises and thus not express the whole picture of the Albanian food industry.

Maxim noted, "Telephone interviews offer many advantages over traditional interview techniques. As indicated, telephone interviews are usually less expensive than face to face interviews, since travel costs are eliminated" (Maxim 1999:300). Unfortunately, telephone interviews would also be ineffective in Albania. Land line telephones are not wide spread in Albania. In fact, according to the MoAFCP agro industry database, only around 25% of enterprises have a fixed telephone line (MoAFCP 2008). In addition, most of the numbers in the database are mobile numbers, which are not very useful for conducting a survey due to high costs of mobile communications.

An alternative method of collecting survey data are through interviews. Rather than asking respondents to read the questionnaire themselves and enter their own answers, researchers send interviewers to ask the question orally and record the respondents' answers. Interviewing is typically done through a face to face encounter (Babbie 2007). Maxim describes face to face interview as follows: "Traditionally, the face to face interview has been the workhorse of survey research, and despite the steady encroachment of telephone interviewing, the face to face interview is still dominant in most parts of the world" (Maxim 1999: 301). According to Dillman (1978), the face to face interview survey method allows for the possibility of obtaining somewhat more complete and accurate results than do other survey methods, but only if interviewers are well-trained and consistent. In this study, this method is judged as the most appropriate to investigate the Food and Beverage industry in Albania, even though it is considered expensive under Albanian conditions.

There are several advantages and disadvantages related to this method of observation. One major advantage is that interview surveys typically attain higher response rates than do mail surveys. A properly designed and executed interview should achieve a completion rate of at least 80 to 85 %, perhaps in part due to the fact that respondents seem more reluctant to turn down an interviewer standing on their doorstep than to throw away a mailed questionnaire (Babbie 2007:264). The presence of an interviewer also generally decreases the number of 'don't know' and 'no answer'. If a respondent clearly misunderstands the intent of a question or indicates that she or he does not understand, the interviewer can clarify the question, thereby obtaining relevant responses. Furthermore, the interviewer can observe respondents as well as ask questions in addition to those asked in the questionnaire.

Face to face interviews have several disadvantages as well (Babbie 2007). They are costly and require more time and staff than a mail or internet questionnaire. In addition, an interviewer training procedure must be done prior to conducting the interviews. Finally, the interviewer's presence should not affect a respondent's perception of a question or the answer given. Thus, the interviewer must be careful to be a neutral medium through which questions and answers are transmitted.

#### **4.2.2 Population and sample selection**

Albanian food and beverage enterprises comprise the basis of the selected sample. From the 2054 food and beverage enterprises registered in the Albanian Ministry of Agriculture Food and Consumer Protection, (MoAFCP 2008), we chose a stratified random sample of 112

enterprises to interview. Out of these 112 enterprises, we were able to actually survey 106 of them.

Random sampling is the best single way to obtain a representative sample. While no technique guarantees a representative sample, the probability is higher with this method than any other (Henry 1990). Robson tells us that sampling theory supports stratified random sampling as an efficient choice because the means and characteristics of the stratified samples are likely to be closer to the mean and characteristics of the population overall (Robson 1993).

Therefore, in preparation for stratified random sampling, the author begins by pre classifying food and beverage enterprises into small, medium and large scale enterprises based on the number of employees. For this study, the number of employees was selected for classifying size strata because there are no other, more appropriate official statistical indicators, such as annual turnover, to be found. The “number of employees” data was provided by the MoAFCP. Then, randomly proportionate % ages of enterprises from each of the three groups were chosen. The rationale behind utilizing this proportionately stratified random sampling scheme was to ensure that different enterprises of different sizes were included in order to get a better representation of the food and beverage sector in Albania. The resulting distribution of sample among districts is shown in the Table 4.1. Industry subsectors that result from sample selection are:

1. Meat products
2. Beverage
3. Pastries industry
4. Fruit and vegetable processing
5. Fish industry
6. Milk processing industry
7. Poultry industry
8. Oil industry
9. Others (including the flour and bread production industry)

**Table 4-1. Distribution of sample size of food and beverage enterprises among districts in Albania (own study)**

District	Durrës	Dibër	Lezhë	Tirana	Fier	Elbasan	Korçë	Gjirokastrë
Total number of enterprises	185	32	23	520	274	124	140	70
Sample size	8	14	6	29	23	14	12	6

### 4.2.3 Conducting the face to face interview

The questionnaire was conducted using a face to face interview approach for collecting the data. Managers or owners of the selected food processing enterprises were initially contacted by phone to schedule a time, date and location to conduct the face to face interview.

In order to ensure clarity and reliable data, all face-to-face interviews for the questionnaire were administered by trained staff. Six students were trained about the questionnaire and about the interview strategy. The procedure began by conducting a questionnaire test, which was carried out in 7 pilot enterprises in the Tirana district. After receiving positive feedback from the test procedure, the actual survey was ready for administration. The survey was conducted during the period from July-September of 2008. By the end of September, 106 questionnaires were completed, resulting in an approximately 96% response rate. By the middle of October 2008, all pre coded questionnaires were ready for entering into an Excel spread sheet and subsequently imported into SPSS for further analyses.

### 4.2.4 Constructing the questionnaire for investigation of quality management systems in food enterprises in Albania

In order to achieve the objectives of this study, a questionnaire was administered utilizing a face to face interview approach. The questionnaire was the result of an assimilation of efforts including consultations with experts in food quality and safety, experts in questionnaire design, extensive literature review, and contact with Albanian processing enterprise owners.

In the questionnaire, the Likert scale (1-5) for categorical answers was used. The most frequent questions the respondents had to answer were in the following format.

- ‘1- Fully, 2- Mostly, 3-Medium, 4- Poorly, 5- Not at all’, or
- ‘1 – Absent, 2 – Weak, 3 – Well, 4 – Very well’ or
- ‘1- Very good, 2- Good, 3- Low, 4- Absent’

These kinds of questions resulted in ordinal variables, but the questionnaire also included many categorical variables such as '1-Yes, 2 - No, 9 - No answer'

The final questionnaire was organized into four main sections (A-D).

- *Section A:* the assessment of the quality and safety of the products. Section A consisted of seven sets of questions, each set of questions relating to a different focus as it relates to the assessment of the quality and safety of the products. The first set of questions within this section is about legislation of the quality and safety of food and beverage products; for example, specific issues such as the level of knowledge of the enterprises regarding European legislation and Albanian legislation and specific directives of Albanian law on food and beverage product quality and safety, just to name a few. In addition, enterprises were also asked about the role of MoAFCP in providing documentation and other informing activities with respect to quality and safety of the food and beverage products. Section also included questions that aimed to investigate the level of information sharing technology in the organization. The questionnaire results from this section also provided information regarding support from MoAFCP in relation to the legislation, and support from the Commerce and Industry Chamber regarding the company food quality and safety.

The second set of questions focuses on the organizational structure and basic documentation that enterprises have in terms of quality management. To be specific, issues such as information flow steps for quality management and general regulation of the company in terms of quality management were asked.

The purpose of the third set of questions within Section A was to investigate the relations of the enterprises with the markets and clients. Enterprises were asked whether the company operates locally or nationally, through distributors or retailers, and whether or not they participate in fairs and expositions.

The fourth important topic addressed in this section was communication with the clients. The questionnaire investigated whether or not companies have experience with communicating food quality and safety issues to clients, how they gather information on client product quality preferences, and on which elements of the commercial quality the company chooses to focus on.

Next, production technology was the fifth topic of interest; for example, questions regarding this topic were designed to investigate the level of the existing production technology in terms of requirements for quality and safety of the products. The enterprises were further asked

about renovation of the technology, about the presence of a production technology specialist within the company and about qualifications of the production employees themselves.

In the sixth and seventh part of section A, the focus was on good management practices and product quality and safety control. The questionnaire attempts to investigate whether the company exhibits the proper climate of responsibility in terms of consumer health. Issues such as specific hygienic-sanitation requirements for production plants and for all other assets owned by enterprises were asked.

- *Section B*: the assessment of the labeling/patenting of the products. In this section, the questionnaire deals with issues such as the need and willingness for patenting and labeling, which standards the company would consider for product certification, positive effects of certification and the financial cost of certification.

- *Section C*: the appraisal of quality management and quality assurance systems. In this section, questionnaire investigates whether the companies know about the system standards like ISO 9001, GAP, HACCP, or TQM and if so, whether or not they enforce them and which of them do they enforce? Within this section there are also questions regarding the consultancy for building up and implementing the quality management system, name of institution, consulting duration, price and total expenses.

- *Section D*: certification with respect to quality management and quality assurance systems. In this section, the company is asked whether their pre-established management system is certified or not. To be specific, enterprises were asked to give some detailed information regarding their year of certification, duration of the certification, effects from certification and some information about the institution that has done the certification.

- *Section E*: general information. Issues discussed included the foundation year of the company, capital, number of employees, annual turnover, products, restrictions in the internal market, export in relation to the annual turnover of the company, renovation of main products, improvement of hygienic-sanitarian conditions, trainings, educational level of the staff and sub-sector where the company is part of.

### **4.3 Statistical analysis for data gathered**

Talking about statistical analysis, first of all we have to make a clear and distinguished classification of variables and define the relevant statistical analysis for each variable measurement level. In this study, as described below in methodology the researcher mostly have nominal and ordinal measurement level for the variables and if it is the case logistic regression and more specifically ordinal regression will be applied for analysis. In the end of this chapter is elaborated the ordinal regression calculations using SPSS computer based software.

#### **4.3.1 Classification of variables**

For this study, the following definition of a variable was used, “*A variable is something that can take more than one value, and those values can be words or numbers*” (Bernard 2000:30). Measurement involves the process by which the empirical events are linked to our basic theoretical concepts. Without sound measurement, empirical science is a vacuous endeavor. Formally, measurement is the process of mapping empirical phenomena onto a system of numbers. Often, it is said that empirical phenomena exists in an *event space*, called domain. Measurement involves the linkage of the events in the domain to events or points in another space called the *range*. Most often, “the range consists of points on a scale” (Maxim 1999:201).

In the social sciences, a modified form of Stanly Smith Steven’s (American psychologist) typology and use of nominal, ordinal, interval and ratio level scales are often used. It should be noted, however, that no consensus exists among methodologists about what is the most appropriate typology. According to Mosteller and Tukey (1997) and Maxim (1999), they suggest that a six-fold typology, based on grades, ranks, counted fractions, counts, amounts, and balances, may be more appropriate (Maxim 1999).

Another classification of variable measurements is one suggested by demographers who argued that is necessary to add at least one more scale, “the absolute scale”, to the measurement typology (Maxim 1999) Absolute measurement consists of a determined isomorphic relationship between the things being observed and the number system. To illustrate, counts, such as in censuses and sample sizes, represent absolute measurements. The difference between ratio and absolute measurement is that a measurement, such as weight can be a ratio and not absolute. That is, “weight can be mapped onto a system of kilograms or pounds without losing any meaning, while counts, on the other hand, have meaning only

when a direct one to one correspondence exists between the domain and the range” (Maxim 1999:204).

As mentioned previously, the most used measurement is the typology presented by Stevens. Babbie (2007:136), provides a thorough description of the variable classification presented by Stevens:

### ***Nominal Measures***

Variables whose attributes have only characteristics of exhaustiveness and mutual exclusiveness are **nominal measures** or **nominal variables**. Examples include *gender*, *religion affiliation*, *political party affiliation*, and *birth place* or *hair color*. Although the attributes composing each of these variables-as *male* and *female* compose the variable *gender*-are distinct. Nominal measures merely offer names or labels for characteristics.

### ***Ordinal Measures***

Variables with attributes we can logically rank – order are **ordinal measures**. The different attributes of ordinal variables represent, relatively more or less, the variable. Variables of this type may be social class, conservatism, alienation, intellectual sophistication, and anything else similar. In addition, to say whether two people are the same or different in terms of an ordinal variable, one may say that one is ‘more’ than the other –that is, more conservative, more religious and so forth, than the other. Examples of ordinal measures may include, appraisal of a company’s inventory level (too low, about right, too high), or response to a medical treatment (excellent, good, fair, poor).

### ***Interval Measures***

For the attributes, describing some variables in terms of the actual distance separating those attributes does have meaning, such variables are interval measures. For these, the logical distance between attributes can be expressed in meaningful standard intervals such as the Fahrenheit scale which is a clear example of the interval scale of measurement. Thus, 60 degree Fahrenheit or -10 degrees Fahrenheit represent interval data.

### ***Ratio Measures***

Most of the social scientific variables meeting the minimum requirements for interval measures also meet the requirements for ratio measures. In ratio measures, the attributes composing a variable, besides having all the structural characteristics mentioned above, are based on a true zero point. Typical examples of ratio scales are measures of time or space. Most statistical procedures do not distinguish between interval and ratio measurement scales.

The importance of measurement level comes in place when the model and level of statistical analysis is about to be used. For different variable measurement levels, there are different

statistical analyses that are possible (this will be discussed later in the following subchapters). Agresti (1996) stated that “methods designed for ordinal variables cannot be used with nominal variables, since nominal variables do not have ordered categories. Methods designed for nominal variables can be used with nominal or ordinal variables, since they only require a categorical scale” (Agresti 1996:3).

### 4.3.2 Relevant statistical analyses

In general, qualitative data may be observed by just looking, listening and feeling; however a different kind of analyses can be done focusing on features or variables of qualitative data, specifically (Bernard and Ryan 2010). To have a clear idea about a kind of statistical analysis that it is appropriate for this study, it is worth do describe the potential analysis currently in place for categorical data analysis or referring to **nonmetric data** (Hair 2006).

Based on (Hair 2006:4) “the analysis dependents may be classified upon the number of variables included in analysis”. **Univariate** analysis is an analysis of a single variable distribution. **Bivariate** analysis is an analysis of two variables that includes cross-classification, correlation, analysis of variance and simple regression. **Multivariate** analysis refers to all statistical techniques that simultaneously analyze multiple measurements of individuals or other subjects under investigation. Thus, any simultaneous analysis of more than two variables can be loosely considered multivariate analysis.

Another classification of analysis is based upon the type of data we gather from a questionnaire or from an experiment or from other sources (Bernard and Ryan 2010). **Qualitative data analysis** includes interpretative text and search for and presentation of meaning in results of quantitative processing such as testing hypotheses against observations. **Quantitative data analysis** deals with turning words into numbers such as classical contents analysis, free list, word counts, pile sorts and statistical and mathematical analysis of numerical data, just to name a few. It is involves testing a hypothesis against observations.

Data analysis involves identification and measurement of variation in a set of variables, either among themselves or between a dependent variable and one or more independent variables. The key in analyzing data is measurement, as the researcher cannot identify variation unless it is measured. Measurement is important in accurately representing the concept of interest and is instrumental in the selection of the appropriate multivariate method of analysis (Hair 2006).

For this study, data findings may be classified as categorical and as such, will follow a theoretical approach that includes categorical data analysis. The appropriate statistical model for categorical data analysis was identified and used for this analysis.

The models for categorical response variables resemble regression models for continuous response variables; however, they assume binomial, multinomial, or Poisson response distributions instead of normality. Two types of models receive special attention in this regard, logistic regression and loglinear models. Ordinary *logistic regression models*, also called *logit models*, apply with *binary* (i.e., two-category) responses and assume a binomial distribution. Generalizations of logistic regression apply with multi category responses and assume a multinomial distribution. *Loglinear models* apply with count data and assume a Poisson distribution (Agresti 2002). Further supported by Agresti (2002), types of relevant statistical models in the case of categorical data analysis are represented in the table below.

**Table 4-2. Types of generalized linear models for statistical analysis of categorical data (modified from Agresti 2002:118)**

<i>Random Component</i>	<i>Link</i>	<i>Systematic Component</i>	<i>Model</i>
Normal	Identity	Continuous	Regression
Normal	Identity	Categorical	Analysis of variance
Normal	Identity	Mixed	Analysis of covariance
Binomial	Logit	Mixed	Logistic regression
Poisson	Log	Mixed	Loglinear
Multinomial	Generalized logit	Mixed	Multinomial response

The subsequent chapters will discuss these statistical models and the one selected for this study analysis (Ordinal Logistic Regression).

### 4.3.3 Selecting the model for statistical analyses

A necessary first step in any analysis of data is to specify a mathematical expression for general behavior of the system that embodies the researcher’s beliefs in an appropriate fashion; this is known as the *systematic component* of the model (see above in 4.4.2). The

general behavior or systematic component (refer to above), is intended to describe an ‘ideal’ response of an individual. Therefore, “in order to take account of the known fluctuations in responses, a *random component* in the model must be included. It must be specified how the random and systematic components are combined” (Krzanowski 1998:8).

For the analysis of this study’s data, the following were taken into consideration:

- Most of the data gathered through the questionnaires are categorical, measured in nominal and ordinal scale.
- Most of the variables are explanatory or independent variables. These variables are measured in ordinal scale.

The following goals were pursued:

- To explain the problems and future trends in quality management systems of the food industry in Albania.
- Identification and measurement of the nature of the relationship between independent and dependent variables
- Prediction of the value of the dependent variable and the weight of each independent variable in explaining the variation of the dependent variable
- Testing the statistical parameters of the model constructed and statistical test for the nominal and ordinal variables included in the model

“Before the multivariate method for the analysis was chosen, the researcher must take into consideration three judgments about the research objective and nature of the data” (Hair 2006:13).

- Can the variables be divided into independent and dependent classification based on some theory?
- If they can, how many variables are treated as dependent in a single analysis?
- How are the variables, both independent and dependent, measured?

As mentioned in the previous chapter, the identification of the appropriate statistical methods is a significant factor in ensuring that study data is properly analyzed (taking into account the nature of the variables).

The analysis of categorical data in this study utilized **Ordinal Logistic Regression**. When dependent variables are classified as ordinal a quandary in model choice is faced; subsequently,, one may forget about the ordering and fit a multinomial logit model that ignores any ordering of the values of the dependent variable. The same model may fit if, for example, groups are defined by variables such as color of car driven or severity of a disease.

Norušis stated that "coefficients may be estimated that capture differences between all possible pairs of groups or a model that incorporates the ordinal nature of the dependent variable may be applied" (Norušis 2008:69)

"Another possible model for analyzing the data is simple linear regression, which is the first relationship anyone is likely to meet between two measured numerical quantities" (Rosenblatt 2002:217). Also, multiple regressions are another appropriate method of analysis when the research problem involves a single metric dependent variable presumed to be related to two or more metric independent variables. Whenever the researcher is interested on "predicting the amount or size of the dependent variable, multiple regression may be applied" (Hair 2006:18). According to Hair (2006) another model for analysis is regression with dichotomous or dummy variables, which act as replacement variables for nonmetric variables (Hair 2006:96). A dummy variable is a dichotomous variable that represents one category of nonmetric independent variables. "Any nonmetric variable with k categories can be represented as k-1 dummy variables" (Hair 2006:96). As such, the idea behind this model is that independent variables must be measured binary.

A *Poisson regression model*, also called a *log linear model*, is a linear model for the log of a Poisson mean.

The Poisson distribution is used for counts of events that occur randomly over time or space, when outcomes in disjoint periods or regions are independent (Agresti 2002). For this study, in terms of independent and dependent variables, this kind of distribution and these kinds of models do not apply.

For this study, the family of logistic regression models receives special attention. "Ordinary logistic regression models, also called logit models, apply with binary data (two-category responses) and assume a binomial distribution. Generalizations of logistic regression apply with multi-category responses and assume multinomial distribution" (this study) (Agresti 2002:4). According to Hair (2006), "logistic regression derives its name from the **logit transformation** used with the dependent variable" (Hair 2006:357).

Logistic regression differs from multiple regression in being specifically designed to predict the probability of an event (probability of an observation being in the group coded 1). Although probability values are metric measures, there are fundamental differences between multiple regression and logistic regression (Hair 2006).

In their original forms, probabilities are not constrained to value 0 and 1 so that if probabilities were to fall between 0 and 1 and needed to be restated, it could be done by expressing a probability as **odds** – the ratio of the probability of the two outcomes or events,

$Prob_i / (1 - Prob_i)$ . In this form, any probability value may be stated in a metric variable that can be directly estimated. Any odds value can be converted back into a probability that falls between 0 and 1 (Hair 2006). The probability calculation, or odds calculation, may be illustrated through an example taken from Hair (2006):

If the probability of success is 0.8, then it is known that the probability of alternative outcome (failure) is 0.2 ( $0.2 = 1.0 - 0.8$ ). This probability means that the odds of success are 4.0 ( $0.8/0.2$ ), or that success is four times more likely to happen than failure. Conversely, the odds of failure may be stated as 0.25 ( $0.2/0.8$ ), or in other words, failure happens at one-fourth the rate of success. In order to keep odds value from going below 0, which is the lower limit of the odds, what is termed the logit value- calculated by taking the logarithm of the odds with

the formula  $\ln\left(\frac{prob_{event}}{1 - prob_{event}}\right)$ , may be computed. If the example were to be pursued, the result

would include  $\ln\left(\frac{0,8}{1 - 0,8}\right) = 1,386$  (Hair 2006).

For the analysis of the ordinal data presented in this work, the binary logistic regression cannot be the basic model. As mentioned previously, the majority of this study's data involves ordinal data that have more than two categories.

Multi-category logit models that deal with ordinal responses assume that at each combination of the levels of explanatory variables, the response counts for the categories of Y have a *multinomial* distribution. This generalization of the binomial applies when the number of response categories exceeds two (Agresti 1996).

The benefit of analysis could not be determined using logistic regression with binary response variables as the data included ordinal measures. The **Ordinal Logistic Regression** was selected as the basic model due to the fact that the dependent variables considered in the model are all ordinal variables. The following sub-chapter 4.3.4 goes into further detail about the model selected for this study.

#### 4.3.4 Ordinal logistic regression

The findings of this research study will be analyzed and quantified using the Logistic Regression model (also known as Ordinal Regression) and will be further discussed in this chapter.

The core point of all multivariate techniques or models is to find if there is any association between dependent variables and independent variables, and if there is, measure the strength

of that relationship. The goal of any method is to select those variables that result in the ‘best’ model within the scientific context of the problem. In order to achieve this goal, one must include: 1) a basic plan for selecting the variables for the model and 2) a set of methods for assessing the adequacy of the model both in terms of its individual variables and its overall fit (Hosmer and Lemeshow 2000a).

“The normal steps of applying an ordinal logistic regression are listed and subsequently discussed below” (Backhaus 2006:433; Morath 2008:128)

#### **a. Building the model**

Agresti (2002) suggests that model selection for logistic regression faces the same issues as ordinary regression. To be specific, the selection process becomes harder as the number of explanatory variables increases, due to the rapid increase in possible effects and interactions. Two competing goals are identified as follows:

- The model should be complex enough to fit the data well.
- On the other hand, it should be simple to interpret, smoothing rather than over fitting the data.

Most studies are designed to answer certain questions and those questions are then used to guide the choice of model terms. Confirmatory analyses then use a restricted set of models; for instance, a study hypothesis about an effect may be tested by comparing models with and without that effect. For studies that are exploratory rather than confirmatory, a search among possible models may provide clues about the dependence structure and raise questions for future research (Agresti 2002). Also, for model selection there are other methods of analogues to forward selection and backward elimination in ordinary regression, as those proposed from Goodman (1971).

Forward selection adds terms sequentially until further additions do not improve the fit. At each stage it selects the term giving the greatest improvement in fit. The minimum *P*-value for testing the term in the model is a sensible criterion, since reductions in deviance for different terms may have different degrees of freedom (df) values. A stepwise variation of this procedure retests, at each stage, terms added at previous stages to see if they are still significant ( Agresti 2002; Goodman 1971)

Norušis (2008) stated that one may disregard the ordering of ordinal variables and fit a multinomial logit model that ignores any ordering of the values of the dependent variable; for example, the same model may fit if groups are defined by color of car driven or severity of a disease. The coefficients may then be estimated to capture the differences between all

possible pairs of groups. A model that incorporates the ordinal nature of the dependent variable may then be applied (Norušis 2008).

**b. Estimation of regression function**

The interpretation of any fitted model requires the ability to draw practical inferences from the estimated coefficients in the model. The question being answered is: *What do the estimated coefficients in the model tell us about the research questions that motivated the study?* Thus, interpretation involves two issues: determining the functional relationship between the dependent variable and the independent variable, and appropriately defining the unit of change for the independent variable. The first step is to determine what function of the dependent variable yields a linear function of the independent variables, which is called the link function (Hosmer and Lemeshow 2000b). In the logistic regression model, the link function is the logit transformation  $g(x) = \ln\{\Pi(x)/[1 - \Pi(x)]\} = \beta_0 + \beta_1x$ .

The SPSS Ordinal Regression procedure, or PLUM (**P**olytomous **U**niversal **M**odel), is an extension of the general linear model to ordinal categorical data. "The five link functions as well as scaling parameters may be specified and the procedure can be used to fit heteroscedastic probit and logit models" (Norušis 2008:69).

SPSS offers five possible link functions:

1. *Logit*  $f(x) = \log(x / (1 - x))$ . This is the default and is recommended when the dependent ordinal variable has relatively equal categories as it offers more interpretable parameter estimates, including odds ratios as measures of effect size, and as use of other link functions often makes no substantive difference in findings. The logit link function is by far the most utilized in ordinal regression.
2. *Probit*  $f(x) = F^{-1}(x)$ , where  $F^{-1}$  is the inverse standard normal cumulative distribution function. It is recommended when categories of the dependent variable are normally distributed.
3. *Negative log-log*.  $f(x) = -\log(-\log(x))$ . It is recommended when lower categories are more probable than higher categories.
4. *Complementary log-log (Cloglog)*.  $f(x) = \log(-\log(1 - x))$ . It is recommended when higher categories are more probable than lower categories. Cloglog models are also called continuation ratio models because the link it establishes is a ratio of the conditional probability that the dependent is at a given level given the predictors, to the conditional probability it is at a higher level.

5. *Cauchit*  $f(x) = \tan(p(x - 0.5))$ . It is recommended when extreme values are present.

Models with terms that reflect ordinal characteristic have improved model parsimony and power.

“The most popular logit models for ordinal response are **cumulative Logit Models**” (Agresti 2002:275):

Cumulative logits: One way to use category ordering forms of logits of cumulative probabilities is by,

$$P(Y \leq j | x) = \Pi_1(x) + \dots + \Pi_j(x), \quad \text{where } j = 1, \dots, J$$

The *cumulative logits* are defined as:

$$\begin{aligned} \log it[P(Y \leq j | x)] &= \log \frac{P(Y \leq j | x)}{1 - P(Y \leq j | x)} \\ &= \log \frac{\Pi_1(x) + \dots + \Pi_j(x)}{\Pi_{j+1}(x) + \dots + \Pi_J(x)}, \\ & \qquad \qquad \qquad j = 1, \dots, J - 1 \end{aligned}$$

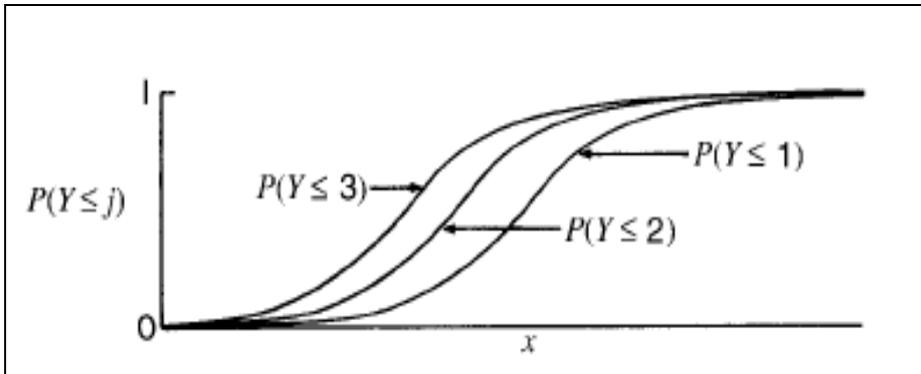
Each cumulative logit uses all J response categories. A model for logit  $[P(Y \leq J)]$  alone is an ordinary logit model for a binary response in which categories 1 to j form one outcome and categories j + 1 to J form the second. Moreover, models can use all J-1 cumulative logits in a single parsimonious model. SPSS uses, for the ordinal logistic regression, the wide spread model of **cumulative Odds Model** or **proportional Odds Model** as is called by (McCullagh 1980: 109-142). A model that simultaneously uses all cumulative logits is:

$$\log it[P(Y \leq j | x)] = \alpha_j + \beta'x, \quad \text{where } j = 1, \dots, J - 1.$$

The ordinal logistic regression can be written in detail to include more than two explanatory variables  $f[P(Y \leq j | x)] = \alpha_j - \beta_1x_1 - \beta_2x_2 - \beta_3x_3$  where  $f [ ]$  is the link function or logit in this ordinal regression function.  $\beta_1, \beta_2, \beta_3$  are regression coefficients of explanatory variables and  $x_1, x_2, x_3$  are the explanatory variables (Morath 2008:129; McCullagh and Nelder 1980).

According to Agresti (2002), each cumulative logit has its own intercept. The  $\{\alpha_j\}$  are increasing in j, since  $P(Y \leq j | x)$  increases in j for fixed x, and the logit is an increasing function of this probability (Agresti 2002: 275). This model has the same effects  $\beta$  for each logit. For a continuous predictor x, Figure 4-1 depicts the model when J = 4. For fixed j, the

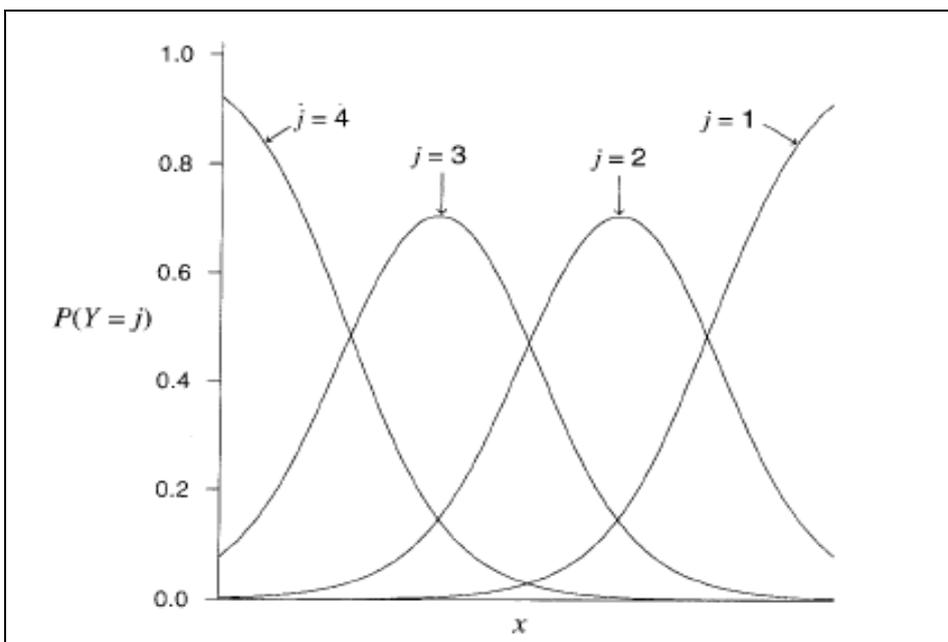
response curve is a logistic regression curve for a binary response with outcomes  $Y \leq j$  and  $Y > j$ .



**Figure 4-1. Cumulative logit model with effect independent of cut point (Agresti 2002:275)**

In the Figure 4-1, three curves are shown to represent the three category probabilities. The response curves for  $j = 1, 2$  and  $3$  have the same shape. These curves share exactly the same rate of increase or decrease, but are horizontally displaced from each other. For  $j < k$ , the curve for  $P(Y \leq k)$  is the curve for  $P(Y \leq j)$  translated by  $(\alpha_k - \alpha_j) / \beta$  units in the  $x$  direction, that is:

$$P(Y \leq k | X = x) = P(Y \leq j | X = x + (\alpha_k - \alpha_j) / \beta)$$



**Figure 4-2. Category probabilities in cumulative logit model (Agresti 2002:276)**

An odds ration of cumulative probabilities is called a *cumulative odds ratio* or *proportional odds model*. The model parameters are estimated with the Maximum Estimation. “*Maximum likelihood estimation* seeks those values of the parameters that maximize the likelihood, or more specifically, the log-likelihood function, which is easier to work with it mathematically” (Hill *et al.* 2008:428)

In logistic regression and as a consequence in Ordinal logistic regression the parameters are estimated by the fitting models, based on the available predictors, to the observed data. The model will be the one that, when values of the predictor variables are placed in it, results in values Y closest to the observed values. Specifically, the values of the parameters are estimated using *maximum –likelihood estimation*, which selects coefficients that make the observed values most likely to have occurred (Field 2009a:267).

In real application the number of individual values will be greater than two, and SPSS statistical computer software will be used to maximize the likelihood function numerically. The likelihood function, if it is assumed that  $Y_{i1}, \dots, Y_{iJ}$  are binary indicators of the response for subject  $i$ , then (Agresti 2002):

Viewed as a function of  $(\{\alpha_j\}, \beta)$ ,

$$\prod_{i=1}^n \left[ \prod_{j=1}^J \pi_j(x_i)^{y_{ij}} \right] = \prod_{i=1}^n \left[ \prod_{j=1}^J (P(Y \leq j | x_i) - P(Y \leq j-1 | x_i))^{y_{ij}} \right]$$

$$= \prod_{i=1}^n \left[ \prod_{j=1}^J \left( \frac{\exp(\alpha_j + \beta' x_i)}{1 + \exp(\alpha_j + \beta' x_i)} - \frac{\exp(\alpha_{j-1} + \beta' x_i)}{1 + \exp(\alpha_{j-1} + \beta' x_i)} \right)^{y_{ij}} \right]$$

McCullagh (1980), and Walker and Duncan (1967) used Fisher scoring algorithms to obtain Maximum Likelihood (ML) estimates to maximize the log-likelihood function.

### c. Interpretation of regression parameters

One of the advantages of logistic regression is that the only information needed is to know whether or not an event occurred in orderto define a dichotomous value as the dependent variable. When logistic transformation is used, the logistic regression and its coefficient, “s”, take on a somewhat different meaning from those found in the regression with the metric variable. The direction of the relationship (positive or negative) reflects the changes in the dependent variable associated with the changes in the independent variable. A positive

relationship means that the increase in the independent variable is associated with an increase in the predicted probability, and vice versa for a negative relationship (Hair 2006)

If the multinomial logistic regression with  $p$  predictors is considered, then (Agresti 2002:183):

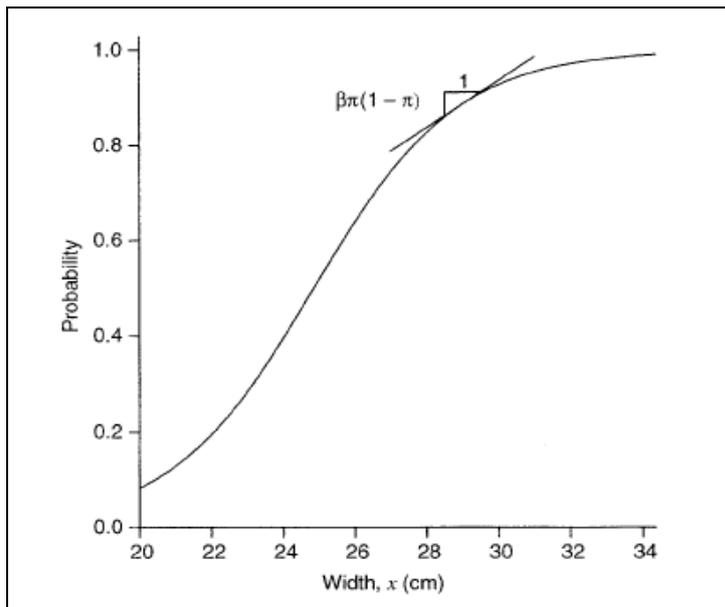
$$\text{logit } \pi(x) = \alpha_j - \beta_1 x_1 - \beta_2 x_2 - \beta_3 x_3 - \dots - \beta_p x_p$$

The parameter  $\beta_i$  refers to the effect of  $x_i$  on the log odds that  $Y = I$ , controlling the other  $x_j$ ; for instance,  $\exp(\beta_i)$  is the multiplicative effect on the odds of a 1-unit increase in  $x_i$ , at fixed levels of other  $x_j$ . An explanatory variable can be qualitative, using dummy variables for categories (Agresti 2002:166):

$$\text{logit } \pi(x) = \alpha_j - \beta x$$

The  $\beta$  sign determines whether  $\pi(x)$  is increasing or decreasing as  $x$  increases. The rate of climb or descent increases as  $|\beta|$  increases; as  $\beta \rightarrow 0$  the curve flattens to a horizontal straight line. When  $\beta = 0$ ,  $Y$  is independent of  $X$ . For quantitative  $x$  with  $\beta > 0$ , the curve in the Figure 4.2 for  $\pi(x)$  has the shape of the logistic distribution. Since the logistic density is symmetric,  $\pi(x)$  approaches 1 at the same rate that it approaches 0.

Exponentiation of both sides from the above equation shows that the odds are an exponential function of  $x$ . This provides a basic interpretation for the magnitude of  $\beta$  (the odds increase multiplicatively by  $e^\beta$  for every 1-unit increase in  $x$ ). In other words,  $e^\beta$  is an odds ratio (the odds at  $X = x + 1$  divided by the odds at  $X = x$ ).



**Figure 4-3. Linear approximation to the logistic regression curve (Agresti 2002:167)**

According to Hair (2006), there is a difference in interpreting the direction of the **Original Coefficients** and the direction of **Exponentiated Coefficients** based on the following:

- Interpreting the original Coefficients

The sign of the original coefficients (positive or negative) indicates the direction of the relationship, just as seen in regression coefficients. A positive coefficient increases the probability, whereas a negative value decreases the predicted probability. This occurs because the original coefficients are expressed in terms of logit values, where a value of 0.0 equates to an odds value of 1.0 and a probability of 0.5. Thus, negative numbers relate odds less than 1.0 and probabilities less than 0.50.

- Interpreting the direction of the Exponentiated Coefficients

Exponentiated Coefficients must be interpreted differently because they are the logarithms of the original coefficient. By taking the logarithm, one is actually stating the exponentiated coefficient in terms of odds, which means that exponentiated coefficients will not have negative values. Since the logarithm of 0 (no effect) is 1.0, an exponentiated coefficient of 1.0 actually corresponds to a relationship with no direction. Thus, the exponentiated coefficients above 1.0 reflect a positive relationship and values less than 1.0 represent a negative relationship (Hair 2006).

**Table 4-3. Two types of logistic coefficients reflecting the relationship of the independent variables in two forms of the dependent variable (Hair 2006:364)**

Logistic Coefficients	Reflects Changes in .....
Original	Logit (logged odds)
Exponentiated	Odds

**d. Assessing the overall fit of the model**

In logistic regression the observed and predicted values to assess the fit of the model may be used. The measure used was the log-likelihood. The **log-likelihood** is based on summing the probabilities associated with predicted and actual outcome (Field 2009b:267):

$$\text{log-likelihood} = \sum_{i=1}^N [Y_i \ln(P(Y_i)) + (1 - Y_i) \ln(1 - P(Y_i))]$$

Therefore, the larger the value of the log-likelihood statistic indicates a poorly fitting statistical model as the larger the value of the log-likelihood, the more unexplained observations there are. The idea behind this model is to calculate a log-likelihood for different models and to compare these models by looking at the differences between their log-likelihoods. One use of this is to compare the state of a logistic regression model against some kind of baseline state. The baseline state that is usually used is the model when only the constant is included; however, in the case of this study’s logistic regression, the baseline model is the model that gives the best prediction when nothing other than the value of the outcome is known, or in other words, this will be used to predict the outcome that occurs most often. If more predictors to the model are subsequently added, then the improvements of the model may be calculated as follows (Field 2009b:268):

$$\chi^2 = 2[LL(new) - LL(baseline)]$$

$$(df = k_{new} - k_{baseline})$$

To be specific, it is multiplied 2 because it gives the result of chi-square distribution and subsequently makes it easy to calculate the significance of the value. The chi-square distribution used for this study has degrees of freedom equal to the number of parameters, k, in the new model minus the number of parameters in the baseline model. The number of parameters in the baseline model will always be 1 (the constant). The final step in this method is comparing the chi-square calculated with the chi-square tabled, which concludes the overall fit of the model (EFQM 2009).

The goodness of fit for the logistic regression model can be accessed in two ways. One way is to assess the model estimation fit using “pseudo”  $R^2$  values. The second approach is to examine predictive accuracy.

The basic measure to determine how well the maximum likelihood estimation procedure fits in the likelihood value is by determining whether or not the logistic regression measures model estimation fits with the value of -2 times the log of the likelihood value (referred to as -2LL or -2 log likelihood). The minimum value for -2LL is 0, which corresponds to a perfect fit (likelihood =1 and -2LL is then 0). Thus, the lower -2LL value the better fitting the model. The -2LL value can be used to compare between equations for the change in fit or used to calculate measures of pseudo  $R^2$ . (Hair 2006:361)

**Pseudo  $R^2$  Measures:** There are several  $R^2$ -like statistics that can be used to measure the strength of the association between the dependent variable and the predictor variables. They are not as useful as the  $R^2$  statistic in regression, since their interpretation is not straightforward (Norusis 2008)

The pseudo  $R^2$  measures are interpreted in a manner similar to the coefficient of determination in multiple regressions. A pseudo  $R^2$  value can be easily derived for logistic regression similar to the  $R^2$  value in the linear regression analysis (Hair 2006). Relying on Norušis (2008), SPSS produces three pseudo  $R^2$  for testing the overall fit of a logistic regression model where  $L(\hat{B})$  is the log-likelihood function for the model with the estimated parameters and  $L(B^{(0)})$  is the log-likelihood with just the thresholds and the number of cases, n, (sum of all weights) (Norusis 2008:81).

McFadens (1973)  $R^2$ ,

$$R_M^2 = 1 - \left( \frac{L(\hat{B})}{L(B^{(0)})} \right) \text{ The value } R^2 \text{ ranges between 0.0 and 1.0.}$$

A perfect fit has a  $R_{\text{LOGIT}}^2$  of 1.0.

Cox and Snell (1989)  $R^2$ ,

$$R_{CS}^2 = 1 - \left( \frac{L(B^{(0)})}{L(\hat{B})} \right)^{\frac{2}{n}}$$

Nagelkerke (1991)  $R^2$ ,

$$R_N^2 = \frac{R_{CS}^2}{1 - L(B^{(0)})^{2/n}}$$

The Cox and Snell (1989)  $R^2$  measures operate in the same manner, with higher values indicating high model fit; however, this measure is limited in that it cannot reach the maximum value of 1. Therefore, Nagelkerke (1991) proposed a modification that had the range of 0 to 1 (Hair 2006). In this analysis, the Nagelkerke pseudo  $R^2$  was used to test the overall fit of the model indicating that a value of 1 represents a perfect fit and a value of 0 does not fit at all. As the concept of  $R^2$  from regression as measures of overall fit was borrowed, this study looked to disseminate analysis for measures of overall predictive accuracy. The two most common approaches are the classification matrix and the chi-square based measures of fit (Hair 2006 :).

**Classification Matrix.** This classification matrix approach develops a hit ratio and distinguishes measures on how well group membership is predicted. The case of logistic regression will always include two groups excluding the chance-related measures. This means that all, maximum chance, proportional chance and Press's Q are applicable as well (Hair 2006:302)

- Maximum Chance criteria should be used when the sole objective of the researcher (in a discriminant analysis) is to maximize the % age classified. It is a standard of comparison for the hit ratio for unequal group sizes.
- Proportional Chance criteria is deemed by many to be the most appropriate when the group sizes are unequal and the researcher wishes to correctly identify members of all groups, not just the largest group. The formula for this criterion is:

$$C_{PRO} = p^2 + (1 - p)^2$$

Where

$p$  = proportion of individuals in group 1

$1 - p$  = proportion of individuals in group 2

- Press's Q statistic. This simple model compares the number of correct classifications with the total sample size and the number of groups. The calculated value is then compared with a critical value (the chi-square value for 1 degree of freedom at the desired confidence level). If

it exceeds this critical value, then the classification matrix can be deemed statistically better than chance. The Q statistic is calculated by the following formula:

$$Press's Q = \frac{[N - (nK)]^2}{N(K - 1)}, \text{ where}$$

$N$  = total sample size

$n$  = number of observations correctly classified

$K$  = number of groups

**Chi-Squared Based Measure.** It is another measure of goodness of fit developed by Hosmer and Lemeshow. They established a classification test where the cases are first divided into approximately 10 equal classes. Next, the number of actual and predicted events is compared in each class with the chi-square statistic. This test provides a comprehensive measure of predictive accuracy that is based not on the likelihood value, but instead on the actual prediction of the dependent variable. “The appropriate use of this test requires a sample size of at least 50 cases to ensure that each class has at least five observations and generally an even larger sample since the number of predicted events should never fall below 1” (Hair 2006:363).

*Hosmer and Lemeshow's*  $R^2$  is calculated (Field 2009b:269) by:

$$R_L^2 = \frac{-2LL(model)}{-2LL(original)}$$

Where:  $R_L^2$  is calculated by dividing the model chi-square (based on the log-likelihood) by the original -2LL (the log-likelihood of the model before any predictors were entered).

**e. Assessing the contribution of predictors**

In this respect, it is of interest to test the null hypothesis that a specified subset of explanatory variables provides no predictive information if the remaining explanatory variables are included in the relationship. This hypothesis is equivalent to the hypotheses that all regression parameters  $\beta_{ij}$  corresponding to this subset of variables are zero (Krzanowski 2000:467).

While in linear regression, the estimated coefficients ( $b$ ) and their standard errors to compute a t-statistic was used. In logistic regression, there is an analogous statistic known as the **Wald** statistic, which has a special distribution known as the chi-square distribution. Like the t-test in linear regression, the Wald statistic tells us whether the  $b$  coefficient for the predictor is

significantly different from zero. If the coefficient is significantly different from zero then it can be assumed that the predictor is making a significant contribution to the prediction of the outcome (Y) (Field 2009b:269).

$$Wald = \frac{b}{SE_b} \text{ where } b = \text{coefficient and } SE_b = \text{standard error}$$

The previous equation shows how the Wald statistic is calculated. The Wald statistic is usually used to ascertain whether a variable is a significant predictor of the outcome; however it is probably more accurate to examine the **likelihood ration statistic**. The reason why the Wald statistic should be used cautiously is because when the regression coefficient (b) is large, the standard error tends to become inflated, resulting in the Wald statistic being underestimated. The inflation of the **standard error** increases the probability of rejecting a predictor as being significant when in reality, it is making a significant contribution to the model (Field 2009b:270).

As recommended by (Hosmer and Lemeshow 2000a:270), the likelihood **ratio test** to assess significance in the case of multi-degree freedom variables should be used. To test for the significance of the coefficient, the log likelihood from the model containing the variables to the log likelihood of the model containing only the constant term was compared. Generally speaking, the likelihood ratio test for the significance of the coefficients for a variable has degrees equal to the number of outcome categories, minus one times the degrees of freedom for the variable in each logit.

Another recommended test for testing the significance of the coefficients is the Score test (Hosmer and Lemeshow 2000a). Proponents of the Score test reduce computational effort as its major advantage. Use of the test is limited by the fact that it cannot be obtained from some software packages. The Score test is based on the distribution theory of the derivatives of the log likelihood (Hosmer and Lemeshow 2000a:16).

#### **4.3.5 Statistical calculation using SPSS**

After having undertaken all the necessary steps elaborated in this chapter, the variable to include in ordinal regression analysis must be decided. For this study, the concept of association, represented by the correlation coefficients, may be utilized. Two variables are said to correlate if changes in one variable are associated with changes in the other variable. The concept of association represented by the correlation coefficient (*r*) is fundamental to regression analysis (Hair 2006).

According to Field (2009), there are two types of correlation: *bivariate* and *partial*. A *bivariate* correlation is a correlation between two variables, whereas *partial* correlation looks at the relationship between two variables while ‘controlling’ the effect of one or more additional variables (Field 2009b:175). Moreover, a *partial* correlation is a correlation procedure in which the relationship between two variables is measured controlling for the effect that one or more variables shared with both of those variables.

In this study, the bivariate correlation was applied in order to determine the association between the dependent variable and each independent variable. Since the study’s data was categorical (mostly ordinal), the Spearman correlation coefficient test of significance was also used. To conduct a bivariate correlation in SPSS, one must first go to ‘Analysis’, then ‘Correlation’ and then ‘Bivariate’. In the main dialog box that appears, Spearman’s rho must be selected and Pearson’s deselected (Pearson’s is the default selection). Also, ‘One-tailed’ test must be selected if a directional hypothesis exists and ‘Two-tailed’ must be selected if a non-directional hypothesis exists.

Therefore, in order to obtain correlation coefficients between the dependent variable and each independent variable, a syntax editor window must be used. The syntax editor may be obtained by clicking the button ‘Paste’ in the main dialog box of the bivariate correlation. Next, input the word ‘*with*’ between the dependent variables and then all other independent variables.

The syntax editor window should look as follows:

Example for Syntax editor in the case of Spearman’s rho bivariate correlation

- NONPAR CORR
- /VARIABLES=Allawofstandartization **With** Allawonmeasurement  
Allawonassessingtheconformity, Allawonprotectingtheconsumers, Allawonfood  
AlMoAFCPpermitorderfornewproducts, ALMoAFCPpermitfortechnicalprocedures  
AlMoAFCPguidelineforfoodproduct, AlregulationforLabelingoffoodproducts  
AllawonSanitation, Alsanitationregulation, MoAFCPinformingprocess  
MoAFCPsupplywithdocumentation, MoAFCPcertificationseminars,  
MoAFCPinspection, InspectionfromInspectiondepartment
- /PRINT=SPEARMAN TWOTAIL NOSIG
- /MISSING=PAIRWISE.

In the example above, the dependent variable (before ‘with’) is correlated with 16 independent variables (after ‘with’). All of the variables were taken from the database of the current study. The correlation procedure above produces a pair of correlation coefficients between the dependent variable and each independent variable. A correlation coefficient +1 indicates that two variables are perfectly correlated; therefore, as one variable increases, the other increases by a proportionate amount. Conversely, a correlation coefficient -1 indicates a perfect negative relationship, if one variable increases the other decreases by a proportionate amount. A coefficient of zero indicates no relationship at all and so if one variable changes, the other stays the same (Field 2009b).

A correlation coefficient is a commonly used measure to determine the size of an effect: values of  $\pm 0.1$  represent a small effect,  $\pm 0.3$  represents a medium effect and  $\pm 0.5$  a large effect. Although the size of the correlation coefficient may be directly interpreted, scientists like to test the hypotheses using probabilities. In the case of correlation coefficients, the hypotheses that the coefficient is different from zero (different from no relationship) may be tested. If that the results reveal that the observed coefficient was very unlikely to happen (no effect in the population), then it can be said, with confidence, that the relationship that was observed is statistically significant.

In fact, there are two ways one can go about testing these hypotheses. The first is to use the  $z$ -score and the second is the  $t$ -statistic with  $N - 2$  degrees of freedom, where  $N$  is the number of observations. In SPSS, the hypothesis that the correlation coefficient is different from 0 is usually tested by using the  $t$ -statistic.

Relying on Field (2009), the most important criterion is that the significance value is less than 0.05; however, if the exact significance value is much lower, then one can be much more confident about the strength of the association. The values that are often used for the significance level are 0.05, 0.01, 0.001 and 0.0001. There are rare cases that one can obtain a significance value that is less than 0.0001 (Field 2009b).

If the significance value is less than 0.05, then null hypotheses is rejected, which states that the correlation coefficient is zero, or in other words, that there is no association between variables. As a consequence, the  $H_1$  hypothesis proves that there is a significant association between dependent and independent variables. Based on the correlation coefficients, one can select the ‘best’ independent variables for building the ordinal logistic regression, because the higher the correlation coefficients, the stronger the relationship and hence the greater the predictive accuracy (Hair 2006).

**Table 4-4. An example of calculating the correlation coefficients (own calculation and data)**

		MoAFCP informing process	MoAFCP supply with documentation	MoAFCP certification seminars	MoAFCP inspection	Inspection from Inspection department
Spearman's rho	Correlation Coefficient	.202*	.231*	.205*	.271**	.142
	Al Law of standardization Sig. (2-tailed)	.039	.018	.036	.005	.148
	N	105	104	105	106	105

\* Correlation is significant at the 0.05 level (2-tailed).

\*\* Correlation is significant at the 0.01 level (2-tailed).

In Table 4-4, the example of calculating the Spearman's rho correlation coefficients for our ordinal variables is given. The Albanian (AL) Law on standardization was taken as the dependent variable and it was investigated how the other variables (remaining five) were correlated with this dependent variable. For this analysis, the syntax editor in SPSS (see above) was used. The first independent variable (MoAFCP informing process) is positively correlated with Al Law on standardization, coefficient of 0.202 with a significant p value ( $0.039 < 0.05$ ). The same explanation applies to the other three variables in the correlation table (Table 4-4). The results begin to change regarding the fifth variable. The correlation coefficient between the dependent variable, the Al Law on standardization and independent variable (MoAFCP inspection) is not significant (p value  $> 0.05$ ).

In this case, this independent variable is not considered for further regression analysis. On the other hand, all other variables that have a significant correlation coefficient can be considered for further regression analysis.

The example regarding the relationship by building an ordinal logistic regression will be further explored in this subsection. To illustrate, the example considers the dependent variable as the 'Al Law on standardization' and independent variable (predictor variable) as the 'Inspection from the inspection department'.

For conducting an ordinal regression analysis in SPSS, one must click 'Analysis', then 'Regression' and then 'Ordinal'. In the SPSS ordinal regression main dialog box, one must select the variable 'Al Law on standardization' and drag it to the Dependent box by clicking the respective arrow button. The next step is to drag the independent variable, in this case the

‘MoAFCP inspection’, and move it to the box labeled Factor(s). All the subcommand of SPSS ordinal regression must be left at the default level and then click OK. The SPSS output is shown in Figure 4-4. The output represents details of ordinal regression analysis between one dependent variable (which is the ordinal variable) and one independent variable.

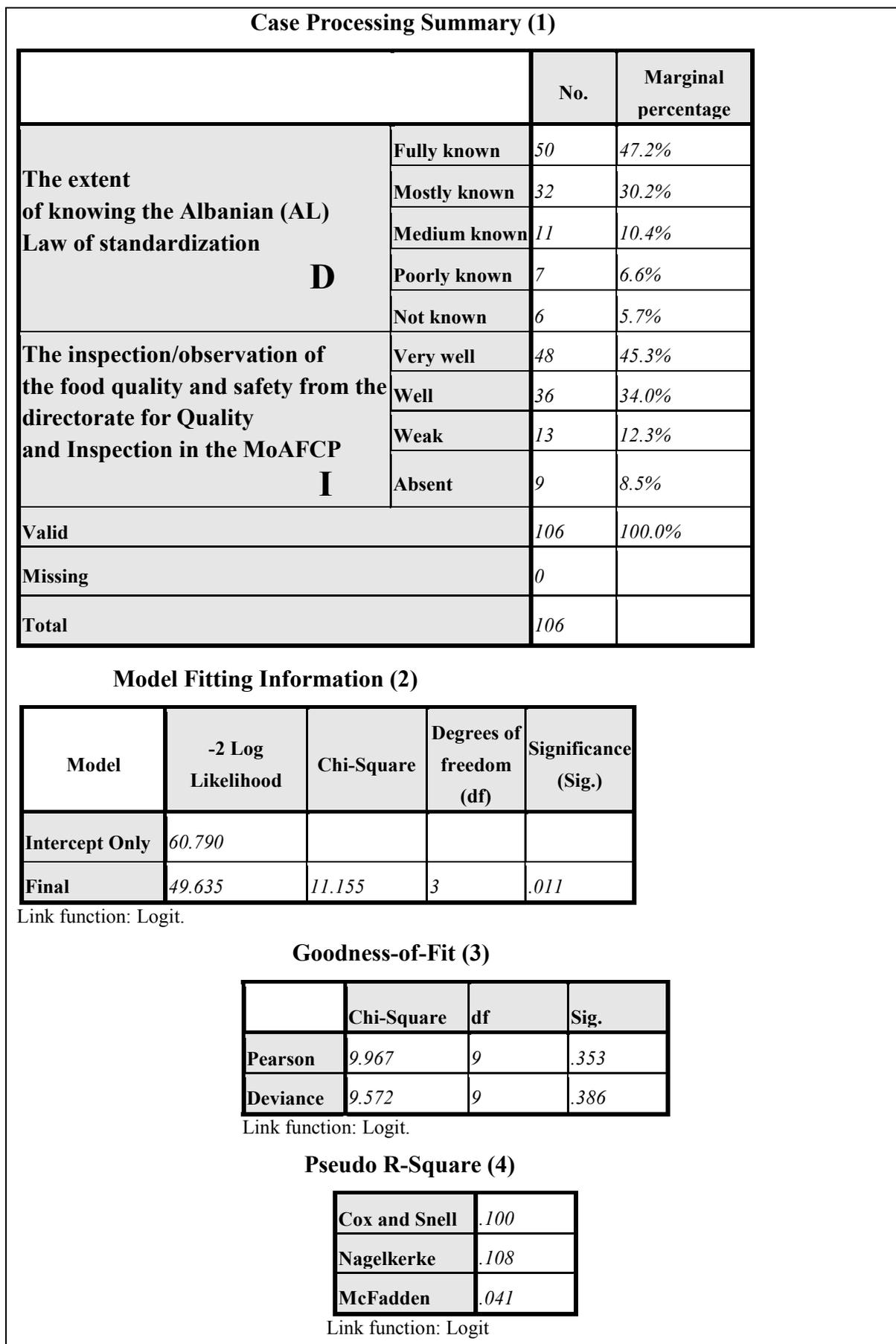


Figure 4-4. The SPSS output for ordinal logistic regression (own study)

Interpretation of the output is as follows:

- The case processing summary (Table (1) within Figure 4-4) represents the % age of each group for the total number of observations ( $N$ ), for dependent and independent variables. The first variable has five categories while the second one has four categories

- The Model fitting information (Table (2) within Figure 4-4) looks at the overall test of the Null hypotheses that the location coefficients for all variables in the model are 0. Judgment was based on the change in -2 loglikelihood when the variables were added in the model that contains only the intercept (Norusis, 2008).

In this case, the difference between the two likelihoods, the chi-square has an observed significance level of 0.011 ( $< 0.05$ ). This means that the Null Hypothesis is rejected, that the model without predictors is as good as the model with predictors; in other words, this model is significantly better than no model. Degrees of freedom are three, the total number of categories of the independent variable minus one.

- Pearson and Deviance statistics in Goodness-of-Fit ) (Table (3) within Figure 4-4) tests the same thing, whether the predicted values from the model differ significantly from the observed values. In this model, these statistics are not significant. Pearson significance is 0.353 and Deviance significance is 0.386, both higher than 0.05, which means that the predicted values are not significantly different from the observed values; or in other words, this model is a good fit

- Pseudo R-Square (Table (4) within Figure 4-4) produces the three measures for ordinal logistic regression analogies with R square in OLS regression. These are additional measures of the model effect size, with higher being better. Nagelkerke's Pseudo R-square is 0.108, which means that 10.8% of the variation in 'the extent of knowing the Albanian Law on standardization' is explained by the independent variable 'The inspection/observation of the food quality and safety from the Directorate for quality and Inspection in the MoAFCP'. Based on this model's analysis, the following chapter will consider Nagelkerke's Pseudo R-square for interpretation of the effect on the size of the model.

## **5. Analysis and Interpretation of the Results**

In this chapter, the data collected from conducting the standardized face-to-face questionnaire are analyzed and interpreted (Questionnaire 2009). Results represent the actual situation in the food and beverage enterprises in Albania with respect to quality management. The structure of the results and interpretation reflect the responses from surveyed enterprises and aim to answer the following research questions:

- What is the level of information that the FBE have regarding legislation (Albanian and international) about food/beverage products?
- What is the relation of FBE with markets and clients for issues related to quality and safety?
- What is the level of production technology in the FBE in relation to the products' quality and safety of their products?
- To what extent is the quality and safety control of the product in the food and beverage industry realized?
- What is the level of product certification in the food and beverage industry?
- What is the level of knowledge about the international quality management and quality assurance systems?
- What is the level of certification with respect to quality management and quality assurance systems?
- What is the general picture of FBE in Albania?

The last subchapter 5.6 measures (through logistic regression analysis) the effect of different business environment factors on different aspects of quality management. The idea behind this analysis is to determine factors that influence implementation of quality management systems and also measuring these influences quantitatively.

### ***5.1 Assessment of the quality and safety of the food products***

The results and their interpretation in this sub chapter deal with the legislation used in food and beverage enterprises. Albanian legislation and EU legislation are treated separately by asking the enterprises about the level of knowledge and the sources of information regarding these legislations.

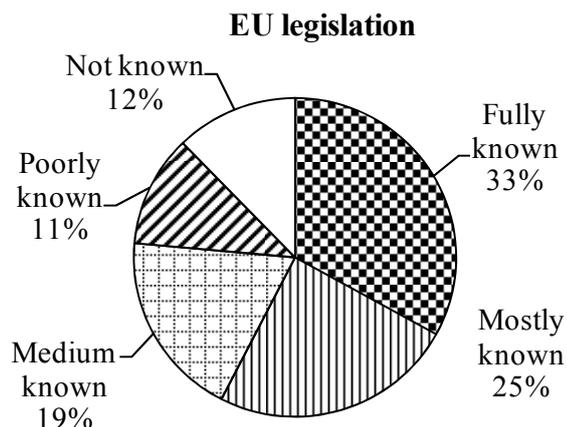
An important issue that was highlighted is the support of governmental institutions (hereinafter MoAFCP) related to the legislation of quality and safety. In addition, the topic of information technology, specifically, computers and connection to internet, is another issue elaborated in this section as it relates to the legislation of food and beverage quality and safety.

### **5.1.1 Legislation regarding the quality and safety of food and beverage products in the Albanian food industry**

The following set of questions presented in this section is taken from section A of the standardized face-to-face questionnaire. The objective of section A was to investigate the level of knowledge about the EU and Albanian legislation regarding food quality and safety. Section A was organized into two parts, part one included questions regarding EU legislation and part two questions regarding Albanian legislation.

Analyzing quality management systems and taking into consideration the fact that Albania wants to join the EU legislation plays an important role in the activity of FBE. It is considered one of the main elements that instigate the prevention of health risks and other possible physical effects to the consumer caused from contaminated or damaged food products. For this reason, it was determined important to state the following question in the beginning of the questionnaire (section A in the questionnaire).

*Question: Is the European legislation about food/ beverage products quality and safety known (directives of EU 93/43/CEE, 96/3/CE, 2001/95/CE) as it relates to the field of hygiene of food beverage products and the general safety of the product?*



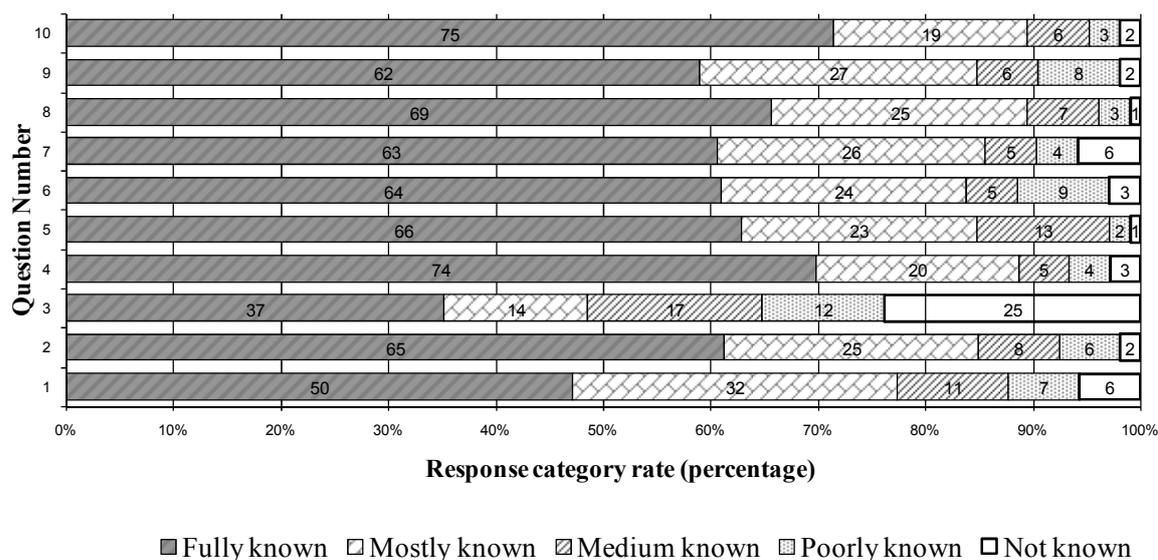
**Figure 5-1. Respondents' extent of knowledge regarding EU legislation regarding quality and safety, Questionnaire 2009**

This question aims to investigate FBE knowledge on the Albanian legislation on food quality and safety as it was originally prepared under the assistance of EU experts and based on EU legislation, thus considers and relates to specific EU directives. Based on the results, over 50% of the Albanian FBE that took part in the survey had full or nearly full knowledge (Fully known or Mostly known) about EU legislation as it relates to food quality and safety. Furthermore, 19% of respondents had relatively basic knowledge (Medium known) regarding this topic and around 23% of them knew little or nothing about it (Poorly known, Not known). The respondents mainly consisted of the FBE themselves with some participation from the institutions in charge for delivering information such as the MoAFCP and its subordinate agencies.

Part two of section A included various questions that assessed the level of knowledge regarding Albanian legislation regarding food quality and safety. A total of 10 questions included the majority of domestic legislation regarding quality and safety of food products. The objective behind this set of questions was to evaluate the conformity of food industry performance with the existing legislation. Questions used within the questionnaire are listed below (section A in the questionnaire):

- 1 Is the "Law on Standardization", No. 8464, dated 11.03.1999, known?
- 2 Is the "Law on the Measurement Units and the Control of the Measurement Units (Metrology)", No. 8996, and dated 30.01.2003 known?
- 3 Is the "Law on Assessing the Conformity", No. 8464, dated 03.07.2003 known?

- 4 Is the “Law on Protecting the Consumer” No. 9135, dated 11.09.2003 known?
- 5 Is the “Law on Food”, No. 7941 and dated 31.05.1995, known?
- 6 Does the Order of the Minister for Food and Agriculture (No.103, dated 20.03.1998) discuss “The procedures of issuing the permits for producing new products”?
- 7 Does the Order of the Minister for food and Agriculture (No. 139, dated 08.04.1998) discuss “The Technical-technological and professional permits for producing food products”?
- 8 Does the Decision-Guideline of the Ministry of Agriculture and Food (No. 224, dated 24.05.2002; No. 295, dated 15.10.2002) include “the Guarantee Deadlines of the food products”?
- 9 Does the Decision-Regulation of the Ministry of Agriculture and Food (No. 604, dated 17.11.2000) include the “Labeling the food products”?
- 10 Are you aware of the Law “On the Sanitation State Inspectorate” (No. 7643, dated 02.12.1992)?



**Figure 5-2. FBE familiarity of Albanian legislation regarding quality and safety of food /beverage products, Questionnaire 2009**

According to Figure 5-2, the majority of FBE that participated in the survey had very good knowledge, Fully Known, (> 80%) of Albanian legislation as it relates to quality and safety of food products. Only a small % of FBE (5-10%) has very few knowledge (Poorly Known) or do not know anything about it (Not Known).

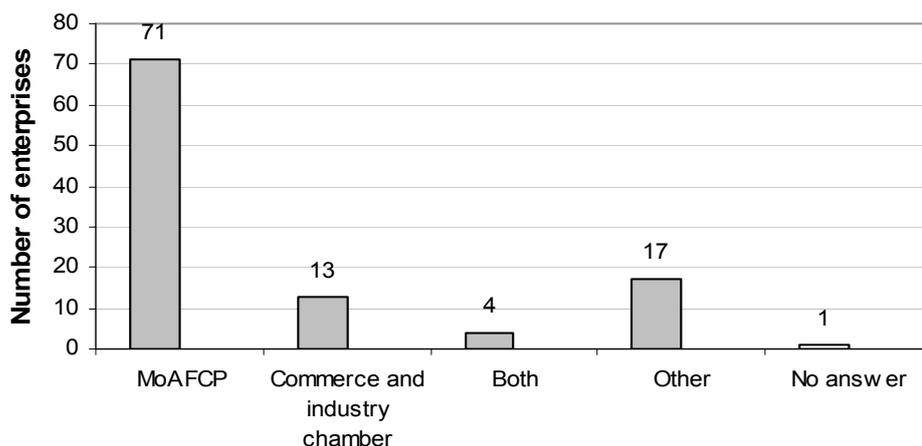
**Key findings regarding food quality and safety legislation**

- Approximately 25% of FBE in Albania know nothing about EU quality and safety legislation.
- 75% of FBE have the necessary information about EU legislation on quality and safety
- 80% of FBE have very good knowledge, “Fully Known”, of Albanian legislation on quality and safety 10% of FBE know very little (Poorly Known) or nothing at all (Not Known) about Albanian legislation as it relates to quality and safety of food /beverage products .

**5.1.2 Sources of documentation regarding quality and safety**

This section of the questionnaire aims to clarify the sources of where the food industry gets their information regarding quality and safety. Three sources were selected to be included in the questions, two public institutions (MoAFCP and Commerce Chamber) and one private (titled “Others”). This section of the questionnaire highlights the need for future improvement of information distribution through public institutions and/or agencies.

Question: *The provision of the documentation of the legislation regarding the quality and the safety of the food/ beverage products is achieved through?*



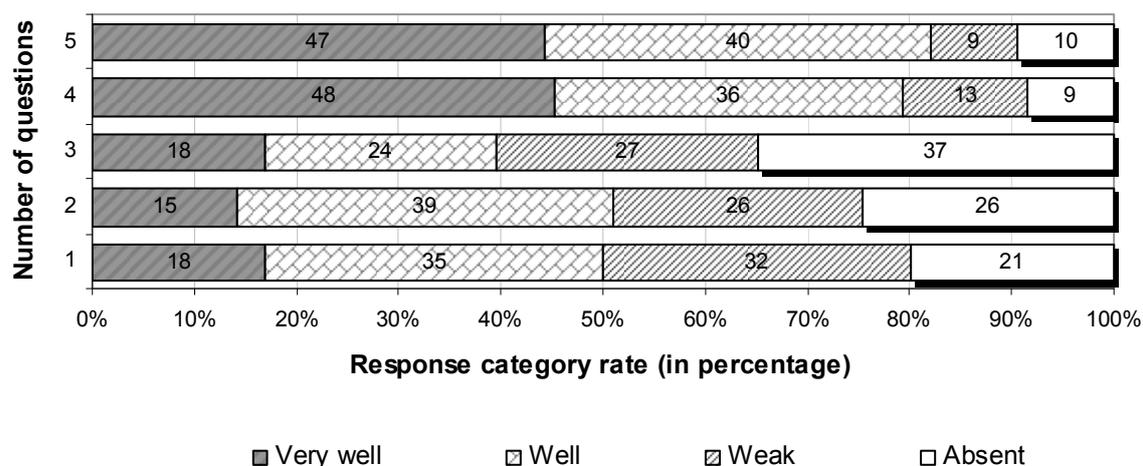
**Figure 5-3. FBE familiarity with the sources of documentation regarding food quality and safety, Questionnaire 2009**

Results reveal that approximately 67% (71 of 106) FBE questioned believe that the MoAFCP is the major contributor to information regarding food quality and safety for the food industry in Albania. Next, “Commerce and industry chamber” count for approximately 12% (13 of 106) of the information and 16% (17 of 106) of the information is designated to “Other” institutions such as non-governmental organizations, national statistical institutions and other private statistical institutions. According to the results, it is apparent the significant role that the MoAFCP has, from the perspective of the FBE, when dealing with legislative information regarding food quality and safety.

Taking into consideration the previous results, the subsequent questions of this section aim to identify the significance of various activities carried out by MoAFCP towards quality aspects in the food and beverage industry such as informational activities regarding legislation, seminars, workshops and inspection. Four sets of activities were listed as they relate to food quality and safety. Furthermore, an additional question for this section investigated the role of the Inspection Department within the Municipality. The questions of this section are listed below.

*The Support of the Ministry of Agriculture Food and Consumer Protection in relation with the legislation, Questions (section A/4 in the questionnaire):*

1. How would you classify the organization of the information sharing process developed by the MoAFCP regarding the food quality and safety legislation?
2. How would you classify the organization of the MoAFCP’s supply of documentation regarding the food quality and safety legislation from MoAFCP?
3. How would you classify the clarity of the seminars held by the MoAFCP regarding food quality and safety legislation?
4. How would you classify the inspection/observation of food quality and safety conducted by the Directorate for Quality and Inspection at the MoAFCP?
5. How would you classify the inspection of the food quality and safety conducted by the Inspection Department in the Municipality?



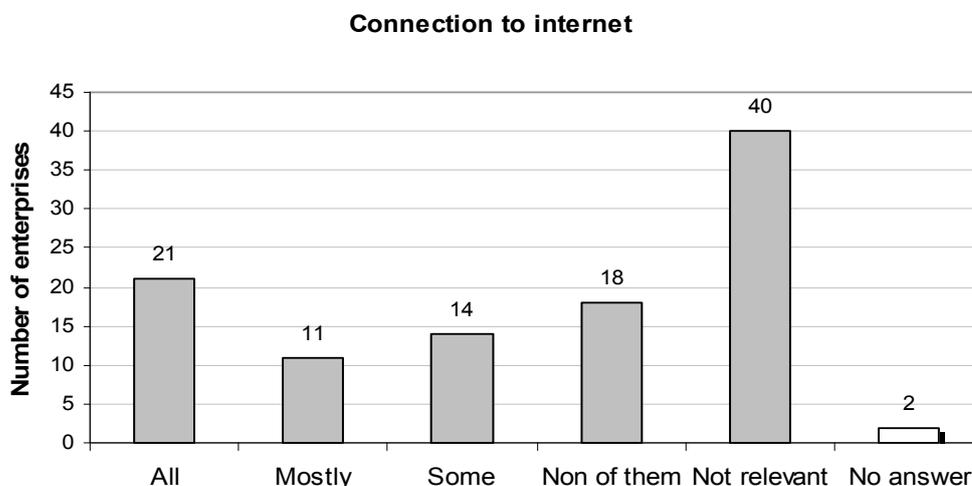
**Figure 5-4. Classification of FBE perspectives of the MoAFCP’s activities regarding food quality and safety legislation, Questionnaire 2009**

Questionnaire results indicate that the first three activities regarding information, documentation, workshops and seminars as they relate to food quality and safety are conducted in an unsatisfying manner (Weak) by the MoAFCP. Less than 20% of the enterprises interviewed believe that the informing process, regarding quality and safety of food products, is done “Very well” by MoAFCP, while only 14% of them agree that supply of documentation in this regard is done “Very well”. Generally speaking, for the first three activities, 40-50% of the FBE believe that the MoAFCP have done “Very well” and “Well” in their activities as they relate to quality and safety of food products. The remaining FBE (> 50%) believe that these activities are either “Weak” (not satisfactory) or “Absent”.

As the graph indicates, nearly 50% of enterprises in the questionnaire believe that inspection activities are done “Very well” by the MoAFCP and the municipality inspection department. If the results for “Very well” and “Well” were to be aggregated for the last two questions, results % it would reveal that 80% of inspection activities are carried out relatively well from both departments within the MoAFCP and municipality. Furthermore, 8% and 9% of the FBE, respectively for questions 4 and 5, believe that the inspection conducted by the inspection departments is “Absent”.

As an additional source of information, FBE were asked about the number of computers that they used in their organization/institution and how many of those computers were actually connected to the internet. Based on the results displayed in Figure 5-5, it was determined that

access to computers and the internet are very important sources for receiving the most current and up to date information regarding food quality and safety.



**Figure 5-5. Number of computers used by the FBE that are connected to the internet, Questionnaire 2009**

According to the questionnaire, 40 of 106 FBE (38%) have answered that using computers in their organization is not relevant (means that they do not use computers), whereas only 2 enterprises did not provide an answer. As such, according to the questionnaire, of the FBE that did have computers, 33 of 106 FBE (31%) had either all or almost all their computers connected to the internet. On the other hand, 14 of 106 FBE (13%) have only some of their computers connected to the internet. These organizations/institutions mainly belong to the group of medium and relatively large scale FBE included in the questionnaire. There are also other FBE that use computers; however, they are not connected to the internet (18 FBE of 106 or 17%).

**Key findings regarding sources of documentation**

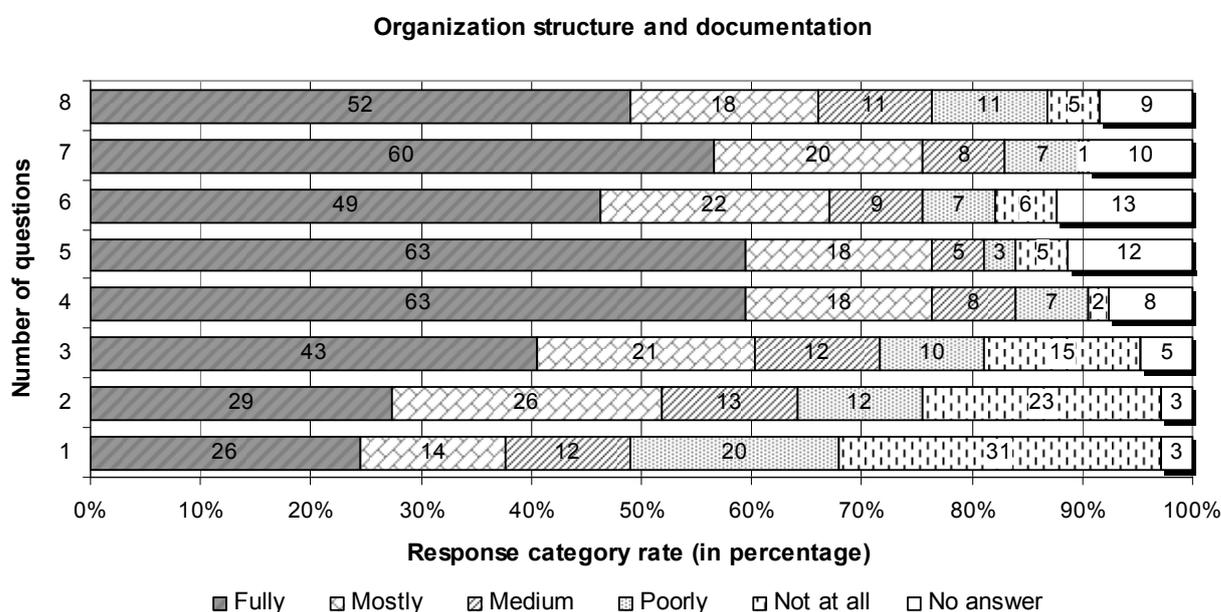
- MoAFCP is the main institution who provides documentation on quality and safety.
- Enterprises view the role of other institutions, such as the Commerce and industry Chamber, in supporting enterprises with the food quality and safety material appears to be weak.
- Approximately 50% of the enterprises judge the service (general informing process, supply with documentation, seminars and workshops etc) from MoAFCP to be weak or absent.
- Enterprises rate the role of the Inspection Department within the MoAFCP and municipality to be of satisfactory level.
- More than 50% (enterprises which do not use computers plus those who use computers but do not have internet connection) of enterprises do not use the internet as an additional source of information for materials regarding food quality and safety.

**5.1.3 The organizational structure and its basic documentation**

Implementing structured phases that reflect the food and beverage products quality and safety requires a well functioning and formalized organizational structure within each organization. This structure can accelerate or delay the efforts of organizations for implementing Quality Management Systems (QMS) or taking other actions with regard to certification. In terms of quality, it is important to emphasize the role of the department of Research & Development and the Quality Control department and the linkages that exist between them within the organization. Organizational structures in enterprises are followed by general regulations where the respective department's responsibilities and the linkages between the departments are also defined. The questions that comprise those specific aspects of management are listed below (section A/II in the questionnaire):

1. Has the company officially made public its organizational structure through its organigram?
2. Is the person (part-time or full time) or Research & Development department part of your organization?
3. To what extent is the person (part-time or full time) or the Sector for controlling the food quality and safety contribute to your organization?
4. Is the General Regulation of the enterprise drafted or made available to its employees and the public?

5. Does the Company's General Regulations distinguish its capabilities and outline the tasks that are related to the food quality and safety management section?
6. Does the Company's General Regulations distinguish its capabilities and outline the tasks that are related to the food quality and safety within the Research & Development department?
7. Does the Company's General Regulations distinguish its capabilities and outline the tasks that are related to the food quality and safety in the Production department?
8. Does the Company General Regulations distinguish its capabilities and outline the tasks that are related to the food quality and safety in the Marketing department?



**Figure 5-6. Enterprises responses regarding enterprises capabilities and appropriateness of the organizational structure and its basic documentation, Questionnaire 2009**

According to the questionnaire, approximately 26 respondents (24.5%) said that they have fully made public their organizational structure and constructed an organization organigram (organization hierarchy), whereas around 31 respondents (29.2%) of them have not made the organizational structure public. Furthermore, results reveal that 29 enterprises (27%) have in their organization either a person dealing with Research & Development or a Research & Development department, whereas 25 enterprises (24%) say that they do not. Next, results as revealing the presence of the person/ sector in charge of quality control include 43 enterprises (40.5%) have a person or sector part of their structure and 33 enterprises (31.1%) say that they mostly or occasionally have a person or sector part of their organization (hiring a part time

person for quality control). The remaining share of enterprises (25 of them or 23.5%) does not have a person or sector dealing with the quality control of their organization.

The analysis for question number 4 and 5 show approximately similar results: 63 enterprises (59.4 %) have developed general regulations within the organization and have allocated the capabilities and tasks related to food quality and safety to their Directorates, 18 enterprises (17%) mostly have developed and allocated the tasks whereas only 14.1% and 12.2 %, respectively, have compiled regulations and allocated the competencies and tasks. Next, 8 (7.5%) and 12 (11.3%) of the enterprises did not answer question number 4 and 5, respectively.

Question number 6, 7 and 8 aims to determine which department has been allocated competencies and tasks related to quality. The results show that 49 (46%), 60 (56.6%) and 52 (49%) have *fully* allocated the competencies and tasks related to quality in the Research & Development department, the production sector and the marketing sector, respectively. These competencies and tasks are *partially* (mostly and medium) allocated in the Research & Development department (31 responses, 29%), in the production sector (28 responses, 26%) and in the marketing sector (29 responses, 27%).

Moreover, 13 enterprises (12%) in the Research & Development department, 15 enterprises (14%) in the production sector and 16 enterprises (15%) in the marketing sector have poorly allocated or not allocated at all the competencies and tasks related to quality. Based on the last three questions, a non response rate revealed 12%, 9% and 8%, respectively.

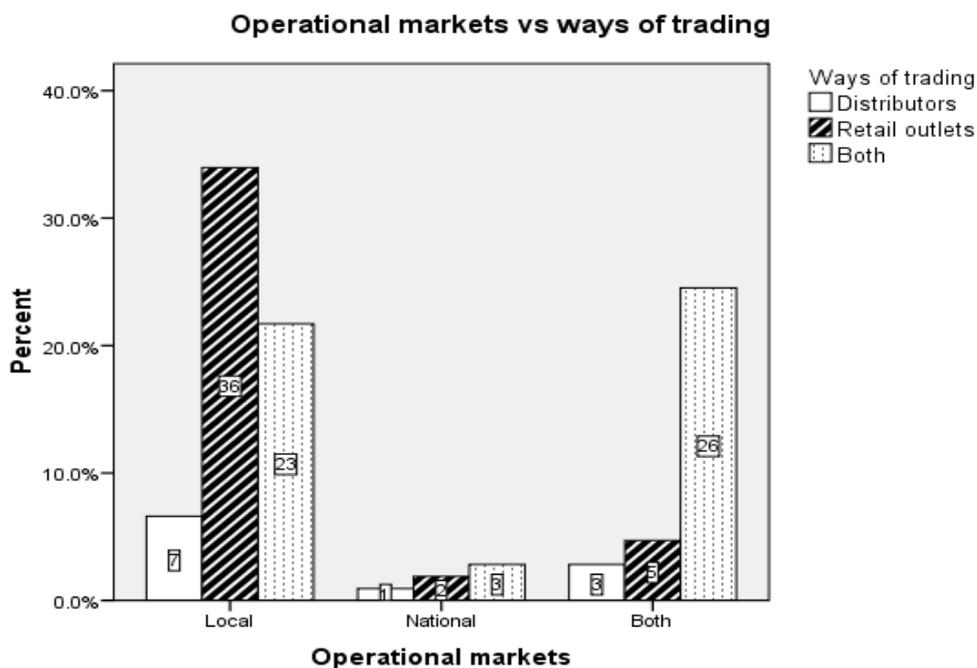
### **Key findings regarding organization structure and documentation**

- Nearly 25% of FBE have established R&D departments in their organizations
- Over 25% do not have R&D department established.
- Approximately two thirds of enterprises have allocated the competencies and tasks related to food quality and safety.
- Usually, more than half of enterprises have allocated tasks regarding quality and safety in the R&D, production, and marketing sector.

### 5.1.4 Relation with markets

The market of products (represented by the consumers), is an element of the external environment of the enterprise that, in principle, is the starting point for formulating the quality and safety requirements. Also in the market, the enterprise has the concrete and real possibility to evaluate its achievements as it relates to commercial quality (quality and safety of the product). The organizational chain that links the market to other structures of the enterprise is its marketing (commercial management), which despite the fact if it is formalized or not, is an activity that practically functions in all the surveyed FBE enterprises.

The idea behind asking questions about operational markets and ways of trading was to determine the effect of the market on product quality and safety. In Figure 5-7, the operational markets and ways of trading of FBE are aggregated together and included in the survey. The aim of this section was to investigate the communication between FBE and consumers by asking FBE about ways of trading.

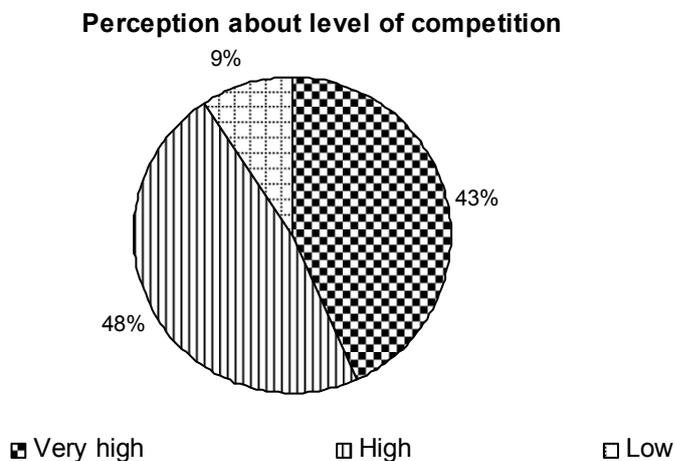


**Figure 5-7. FBE responses to reflect their view of operational markets and ways of trading, Questionnaire 2009**

Results show that FBE believe that 66 enterprises (62%) operate in local markets, while 6 enterprises (6%) operate in national markets and the remaining 34 enterprises (32%) operate in local and national markets. Generally, enterprises operating in local markets belong to

small and micro scale enterprises, while those operating in both national and local markets belong to medium and large scale enterprises. As Figure 5-7 shows, of those operating in local markets, 36 of them sell their products through retail outlets (signifying close relations with consumers), 23 of them sell through retail outlets and distributors, while only 7 of them sell only through distributors. Regarding the enterprises that operate at both levels (local and national), only 5 of them (15%) sell only to retail outlets while 26 of them (76%) sell through both distributors and retail outlets. Only a small number (6) of FBE are operating in national markets and within this group, one sells through distributors, 2 of them through retail outlets and 3 of them through distributors and retail outlets. Based on these results it can be said that enterprises that operate in local markets are less concerned about the quality and safety of their products (due to low competition) compared to those that operate in national markets. This may be because the high competition in national markets requires (through consumers) improved products quality and safety.

The perception of the level of competition is judged as an incentive factor for quality improvement. With this in mind, Figure 5-8 shows the responses of FBE when asked about their perception in this regard.



**Figure 5-8. Perception of FBE about level of competition they ‘feel’ in the market, Questionnaire 2009**

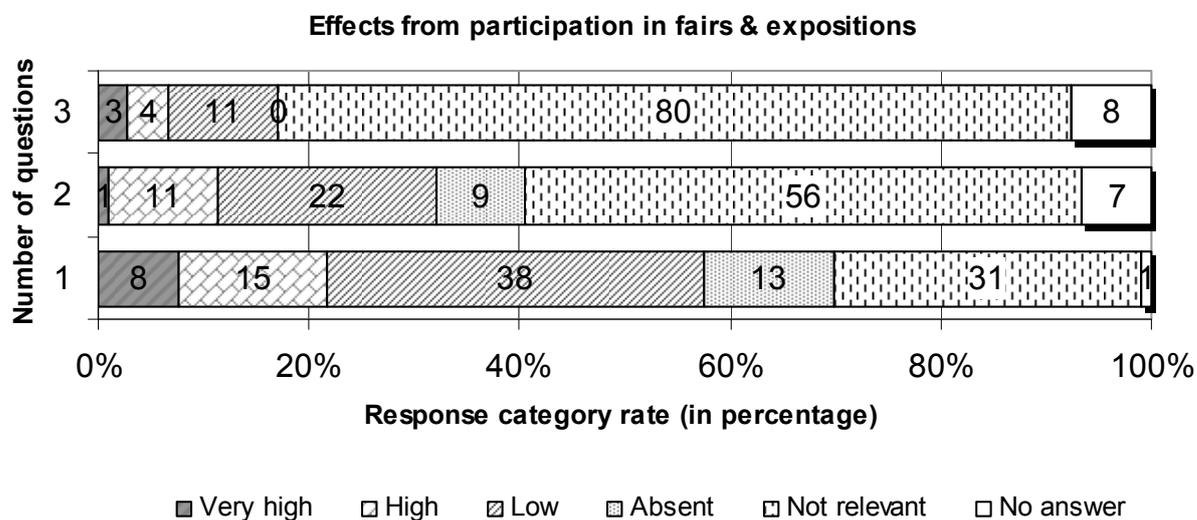
Based on questionnaire results, 48% of FBE (out of 106) stated that they ‘feel’ a very high level of competition in operational markets, 43% of them ‘feel’ a high level of competition in operational markets and only 9% of them stated low perception about level of competition in operational markets. Respondents who stated low perception about competition belong to relatively large scale enterprises that have a consolidated market share and consolidated

marketing strategy, while those who ‘feel’ very high or high competition in their markets are small and micro scale enterprises with very limited market power/influence.

Another question asked within the framework of relations with market/clients was: “What is the impact of food quality and safety coming from the participation in fairs and expositions?” The objective of this question was to investigate whether there are positive effects, as they relate to product quality and safety improvements, from selling the products in fairs and expositions. First, FBE were asked about their participation in fairs and expositions by categorizing their participation as Local, National or International and then about the impact that participation had on their products’ quality improvement. The questions asked were as follows:

1. Have you participated in local fairs and/or expositions in the last five years?
2. Have you participated in national fairs and/or expositions in the last five years?
3. Have you participated in international fairs and/or expositions in the last five years?

Figure 5-9 below shows the graphs that were developed regarding FBE responses to their participation in fairs and/or expositions and the effects from this participation.



**Figure 5-9. Effect on the products quality and safety improvement from participations in fair and expositions, Questionnaire 2009**

Results show that 74 of participating FBE (70%) of them have participated in local fairs and/or expositions, whereas 32 of them (25%) have not participated and only one enterprise did not answer the question. Next, 23 of FBE (30%) of the 74 enterprises who participated in

local and/or international fairs answered that the positive effects from this participation on product quality and safety improvement have been either high or very high, while 52 enterprises (70%) out of the 74 enterprises that have participated answered that the positive effects have been either low or absent.

Next, for the participation in national fairs /or expositions the results are different. To be specific, 56 FBE (53%) who participated answered that they have not participated in these events, while the remaining 42 of them (40%) have participated, and 7 enterprises (7%) did not answer the question. In addition, the results show that 12 FBE (29%) out of 42 stated high or very high positive effects on product quality improvement and 31 of them (71%) stated that the effects have been either low or absent.

The final question regarding the participation in international fairs and/or expositions reveals that out of 106 FBE included in the questionnaire, only 18 of them (17%) have participated in these events, 80 enterprises (75%) have not participated, whereas the remaining 8 (8%) FBE did not answer the question. Moreover, 7 out of 18 (39%) FBE participated in these events stated that the positive effects have been high or very high, and for the other 11 enterprises (61%) participation have had low effect on product quality and safety improvement.

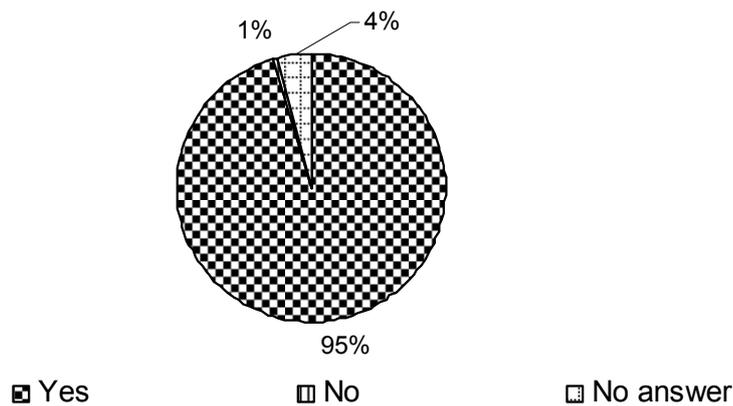
### **Key findings on “Relation with markets “**

- Nearly two thirds of FBE operate in local markets, while one third operates in local and national markets.
- Of the FBE who participated in these fairs and expositions, most of them used distributors and retail outlets as way of selling their products.
- Of the overall results, 70% of FBE participated in local fairs and expositions to promote their products, whereas more than half of them have participated in national fairs and expositions.
- Two third of FBE have not participated in international fairs and/or expositions.
- The majority of FBE agree that the positive effects from participations in fairs and/or expositions have been either high or very high.
- More than 91% of FBE feel high competition in the markets that they participate (resulting as an incentive for quality improvement).

### 5.1.5 Relation with costumers in terms of food and beverage quality and safety

The first two questions of the questionnaire following the section ‘Relation with costumers in terms of quality and safety’ aims to investigate if FBE openly communicate with costumers regarding product quality and safety and how they gather the feedback from costumers with respect to product quality and safety. According to Figure 5-10, 95% of FBE included in the questionnaire said that they communicate with clients regarding product quality and safety, whereas only 1% of them stated no communication in this regard. Last, 4% of FBE in the questionnaire did not answer to this question.

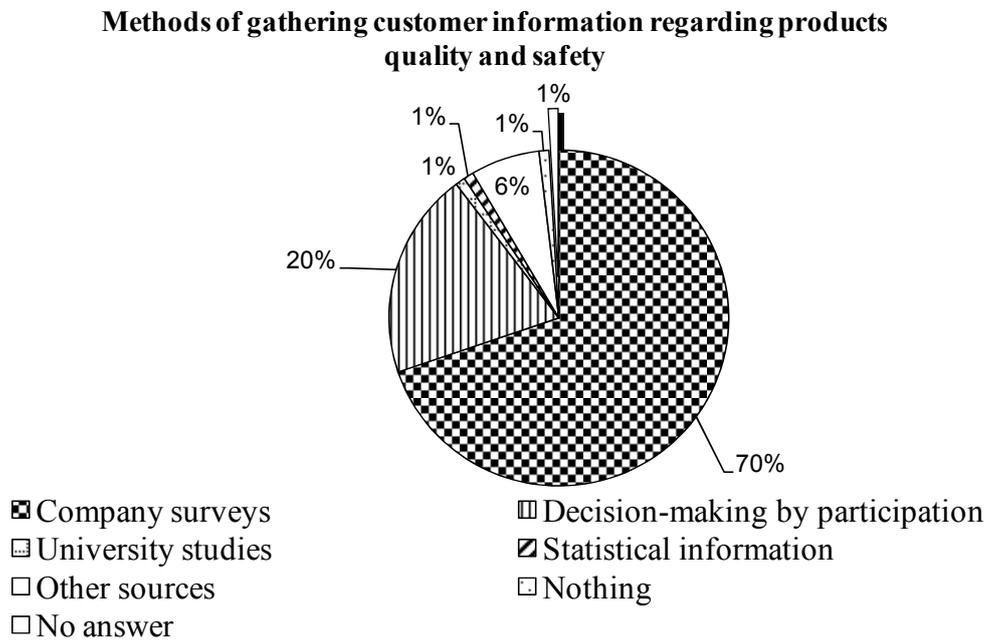
**Experience communicating with clients about product quality and safety**



**Figure 5-10. Communicating with clients about the company’s products quality and safety, Questionnaire 2009**

The next question aims to investigate the method that FBE use to reach out to their customers for gathering information with respect to quality and safety of their products. Five possible approaches of gathering this information were listed within the questionnaire; Figure 5-11 reveals the results. The majority (70%) of FBE who participated in this question stated that they gathered their feedback and information with regard to quality and safety by conducting company surveys. Decision-making by employee participation (employee involvement in decision making with respect to products quality and safety) is another method to gather the information used by 20% of the FBE participating in the questionnaire, while 6% of them used other methods to gather feedback information. Only 1% of FBE utilized statistical

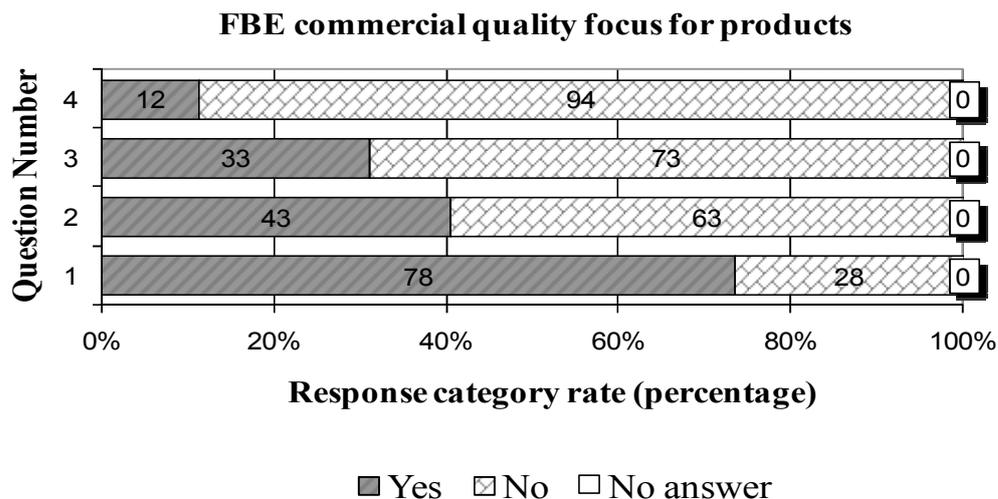
information gathered from public institutions for their information, 1% did not use any method of gathering information and the last 1% did not answer the question at all.



**Figure 5-11. Different approaches used by FBE for gathering customers' feedback and information regarding product quality and safety, Questionnaire 2009.**

By using the following set of questions, the aim was to investigate what form off commercial quality FBE focused on for their products.

1. Is your company focused on the product in terms of commercial quality?
2. Is your company focused on the product price in terms of commercial quality?
3. Is your company focused on the product delivery in terms of commercial quality?
4. Is your company focused on other safety measures in terms of commercial quality?



**Figure 5-12. Elements of commercial quality that the company is focused on, Questionnaire 2009**

For question 1, the majority (74%) of FBE who participated in this section of the questionnaire said that they focused most on the product as an integrated aspect of product quality, while the rest of them (26%) did not focus on the product in this regard.

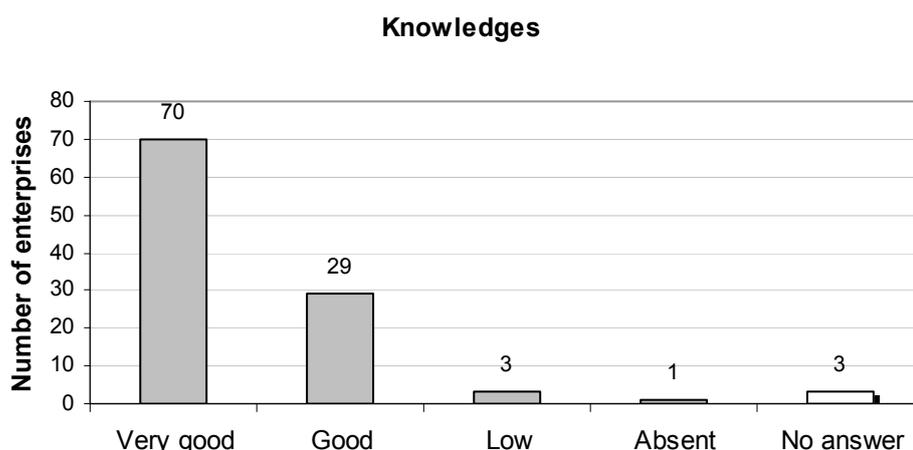
A different picture is presented (Figure 5-12) for the last three questions. FBE responded that they focused on product price, product delivery and other safety measures: 41% (43 enterprises), 31% (33 enterprises) and 11% (12 enterprises), respectively. Meanwhile, the numbers of FBE that do not pay much attention on product price, product delivery and other safety measures increased compared with the first question. To be specific, 59% of enterprises (63 of ??) do not focus on product price as an aspect of commercial quality, 69% (73) do not focus on product delivery and 89% (94) do not focus on other safety measures of commercial quality.

**Key findings on “Relation customers”**

- Almost all FBE (95%) communicate with costumers regarding their products quality and safety
- The majority of FBE (70%) gather feedback and information on product quality and safety by using a company developed survey.
- FBE very rarely use information from scientific studies (available in governmental scientific institutions and in universities) to gather information on product quality and safety.
- In terms of commercial quality, results reveal that 78% of FBE focus on production activities, 43% of them focus on price and only 33% focus on product delivery and services.

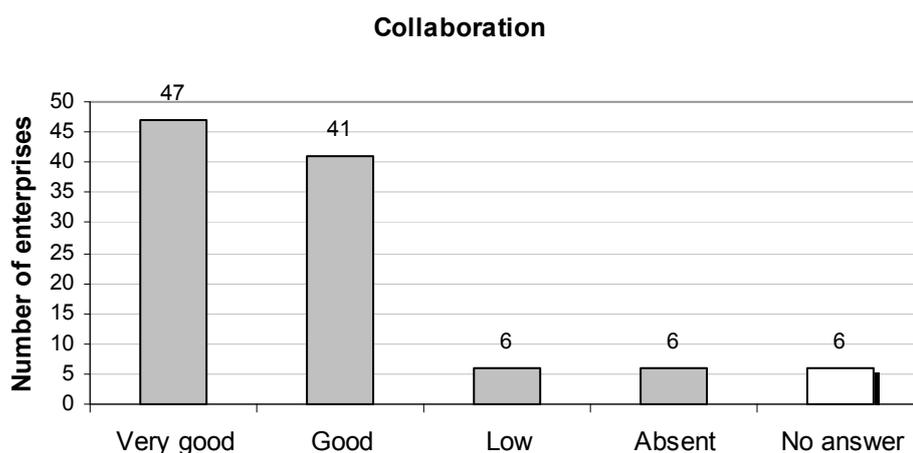
**5.1.6 Collaboration between sectors**

This section of the study aims to investigate the marketing sector’s extent of knowledge about quality and safety problems and the relationship between the marketing sector and other sectors (Research & Development, production and quality control) in quality and safety. Investigating these relationships is important in order to understand how FBE pass their information from customers (marketing sector) to the other sectors mentioned above. Figure 5–13 shows the results of the extent of knowledge of the marketing department about quality and safety problems.



**Figure 5-13. Overall extent of knowledge by the marketing department of quality and safety problems, Questionnaire 2009.**

According to Figure 5-13, the marketing sectors have a very good knowledge about quality and safety problems of the products. To be specific, 70 of FBE (66%) who participated in this section of the questionnaire admitted that whereas 29 enterprises (27%) of them said that the marketing sector in their organization have good knowledge about quality and safety problems. Only a small number of enterprises stated low and absent knowledge of their marketing sectors on quality and safety problems, 3 enterprises (3%) and 1 (approximately 1%), respectively, and 3 enterprises did answer the question.



**Figure 5-14. Collaboration between the marketing sector and other departments in the organization regarding quality and safety, Questionnaire 2009**

Based on the results for this question (Figure 5-14), it has been found that a good or very good collaboration between the marketing sector and other (Research & Development, production and quality control) in terms of products quality and safety. To be specific, 88 of participating FBE (83%) stated a good and very good collaboration exists between the marketing sector and other sectors. Moreover, 6 enterprises (6%) of them states low and/or absent collaborations between the marketing sector and other departments/sectors in the FBE. Last, 6 enterprises (5%) did not answer the question.

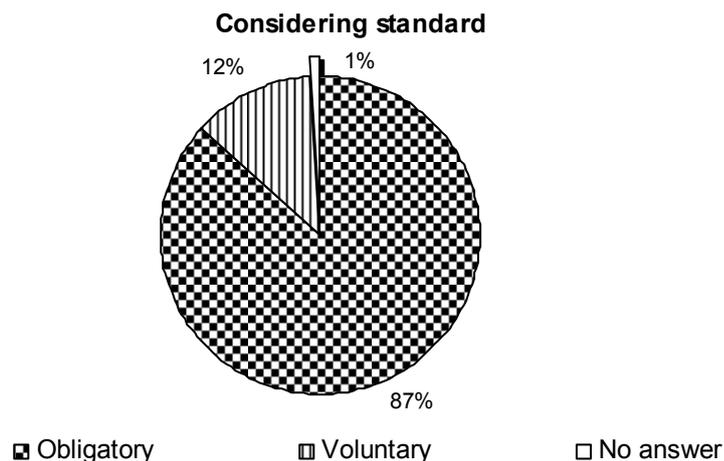
**Key findings on the collaboration between sectors:**

- FBE's believe that the marketing sector has good or very good knowledge about product quality and safety.
- More than 80% of FBE feel that the collaborations between the R&D, production and quality control departments are very well organized.
- Around 20% of FBE believe that the collaboration is very weak or absent.

### **5.1.7 Technical specification – standards of the food and beverage products**

FBE documents supporting product technical specifications generally contain product quality and safety standards and specifications that must be met by the final end products. To be specific, each stage of product development (from the initial raw material to the final end product) should be in compliance with these technical specifications, only in this case are enterprises required to have a final product in full compliance with quality and safety standards.

Referencing Albanian legislation, “standards” are technical documents of voluntary use, whereas “technical rules”, based on the defined standards (as well as other legal acts and by-laws of the relevant ministries) are documents whose application is obligatory for food and beverage enterprises. In this legal framework it is based on the voluntary and obligatory certification practices. The FBE that participated in this section of the questionnaire were asked how they would consider the standards of the products they produce.

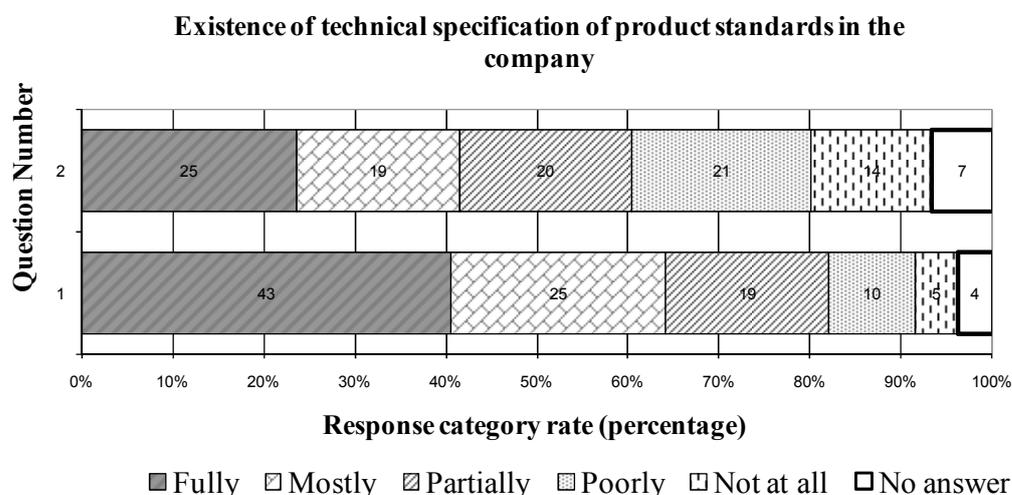


**Figure 5-15. FBE’s understanding of the standards enforced on the products that they produce, Questionnaire 2009**

The results revealed that 87% of the FBE that participated in this section consider the national standards and international standards (mainly ISO) as obligatory, whereas only 12 % of FBE consider these standards as voluntary. Only 1% of the FBE participating in the questionnaire gave no answer.

Regarding technical specifications of product standards, FBE were asked if they have compiled technical specifications and inter-operational specifications for their products. The questions were as follows:

1. Has the company compiled its technical specification for their products?
2. Has the company compiled the inter-operational specifications for their products?



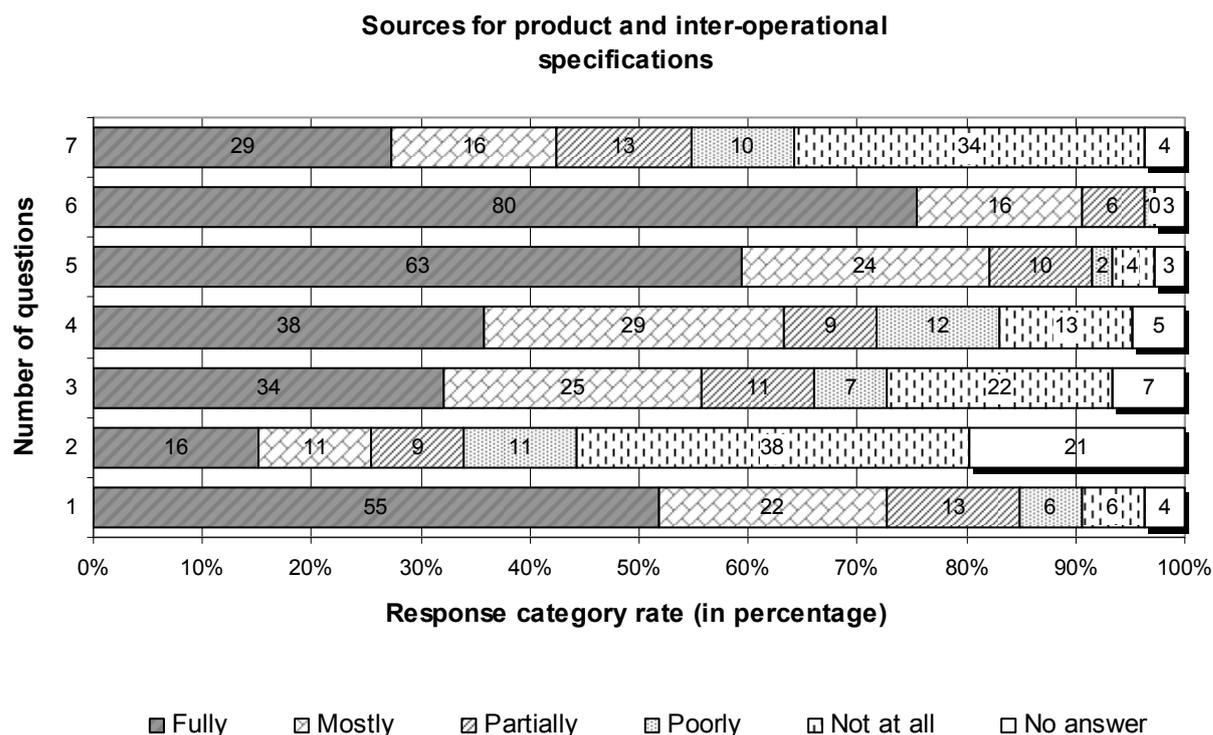
**Figure 5-16. Compiled technical specifications in the enterprise, Questionnaire 2009**

Results indicated that 68 FBE (64%), who participated in this section, have mostly or fully compiled technical specifications for their products, while 29 FBE (27%) have done this 'partially or poorly'. Next, 5 enterprises (5%) stated that they have not done and documented this kind of technical specifications whereas 4 enterprises did not answer this question. Results for question number 2 regarding inter-operational specification, show that compared to the products technical specification, inter-operational specifications have been compiled in a satisfactory manner by a lower number of enterprises. To be specific, 44 of FBE (41%) have mostly or fully compiled inter-operational specifications. A small number 39%) of companies (compared to product technical specifications) have compiled inter-operational specifications partially or poorly. Moreover, 14 enterprises (13%) have not compiled inter-operational specification while 7 enterprises (7%) did not answer the question.

This section continues with the sources that enterprises used to compile product and inter-operational technical specifications. In the questionnaire (insert actual section number of questionnaire that these question are listed so reader can easily reference or go to within appendix), seven sources of information were listed.

Questions: Sources for the compilation of the product technical specifications

1. Is the Law on Standardization applied?
2. Is Codex Alimentarius used?
3. Is the client technical specification used?
4. Did you use the information on the Catalogue for the Albanian Standards?
5. Is the Albanian standard used?
6. Is the standard of the organization used?
7. Is the foreign Standard used?



**Figure 5-17. “FBE response regarding use of specific sources for product and inter-operational specifications, Questionnaire 2009**

According to the results, Albanian Law on Standardizations (question 1) is fully or mostly used by 77 FBE (73%) as a source for compiling product and inter-operational technical specifications, while 19 enterprises (18%) stated partially or poor usage of this standard as a source for compiling specifications. Results for the second question revealed that only 27 FBE (26%) have used the Codex Alimentarius as a source for technical specifications, 20 FBE (19%) have used this standard partially or poorly and 38 FBE (36%) have not used this standard as source for compiling technical specifications at all. A relatively large number (19%) of FBE included in the questionnaire did not answer this question.

For question number three on applying client technical specification as a source for compiling specification, 59 FBE (56%) stated that they mostly or fully used client specifications for compiling and documenting product and technical specifications. In addition, 18 of FBE (17%) used client technical specifications partially or poorly, whereas 22 enterprises did not use client specification as a source for compiling product and inter-operational specifications.

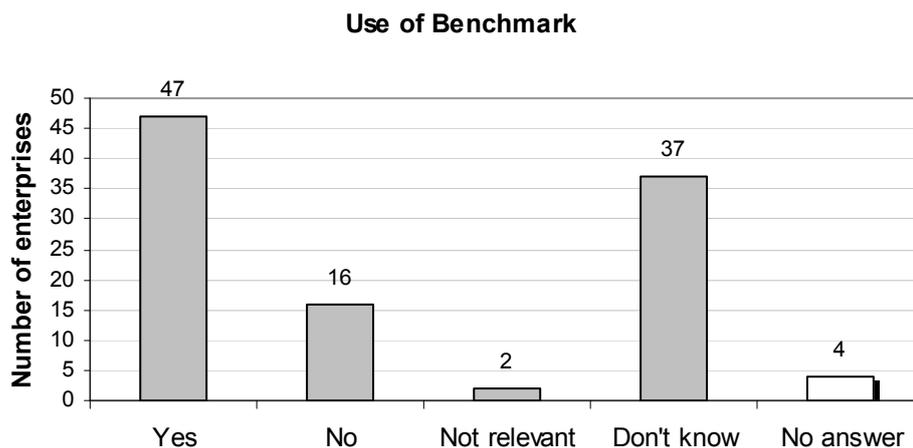
For question number four regarding the Albanian catalogue about technical specifications, 67 of 106 FBE (63%) who participated in the questionnaire admitted that they use this catalogue as a source for technical specification fully, while 21 FBE (20%) used this catalogue partially

or poorly. Next, 13 enterprises (12%) did not use the catalogue as a source and 5 enterprises (around 5%) did not answer the question.

Question number five asks about the level of usage of Albanian standards as a source of information in compiling product and inter-operational technical specification. Many more enterprises (compared to usage of Albanian catalogues) have used Albanian standards mostly or fully (87 enterprises or 82%). A small number of FBE (11%) have used these standards partially or poorly as a source of information for compiling technical specifications, whereas of them did not use this as a source at all.

Question six and seven asked about the usage extent of organization standard and foreign standards as a source of information. The results revealed that while 96 enterprises (91%) in the survey stated that they mostly or fully used organization standards (here they refer to the products' technical specifications) as a source of information for drafting technical specifications materials, only 45 enterprises (42%) stated the same regarding usage of foreign standards such as Codex Alimentarius. Meanwhile only 6 enterprises (6%) admitted that they partially used organizational standards as a source and 23 enterprises (22%) admitted that they used foreign standards as a source of information partially or poorly. A number of 34 enterprises (32%) have not used foreign standards as source of information for drafting product and inter-operational technical specifications.

It was also asked in the questionnaire if FBE have used the Benchmarking method (comparison with the best) in the process of drafting product and inter-operational technical specifications. Based on the results, it was found that many of the enterprises in the survey do not know anything about this method. To be specific, 47 enterprises (44%) have used the Benchmarking method during the process of drafting technical specifications, while 26 enterprises (15%) have not used this method at all (Figure 5-18). Moreover, what is of concern is that 37 enterprises (35%) out of 106 did not know anything about this method, 2 enterprises stated this method was not relevant and 4 enterprises gave no answer at all.



**Figure 5-18. FBE utilization of the Benchmark method for drafting product and inter-operational technical specifications, Questionnaire 2009**

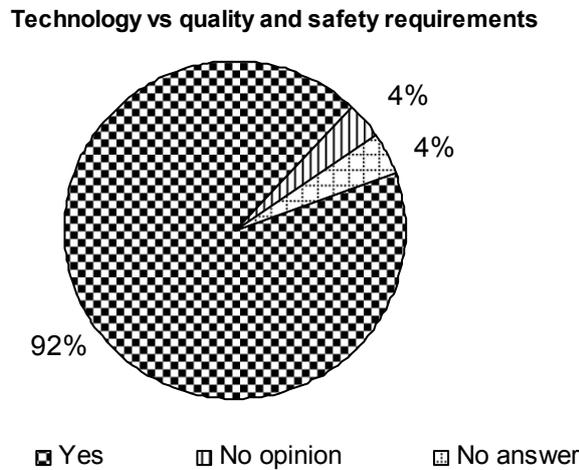
**Key findings regarding technical specifications and standards**

- Nearly 90% of FBE consider the standards of products as obligatory.
- 65% of them have fully or mostly compiled technical specifications for their products
- Less than half of FBE (41%) have compiled inter-operational specifications for product realization.
- Usually FBE use their own standards for compilation of product technical specifications and inter-operational specifications (around 90%).
- Use of foreign standards for product certification is not widely spread.
- Almost half of the enterprises do not use Benchmark method during process of drafting technical specification and inter-operational specifications, or “don’t know” anything about it.

**5.1.8 Technology of the product**

The technology of production is a crucial and very important element in the food and beverage enterprises. It is the basis that makes transformation of the raw materials in the final product possible, and has a significant role in producing in compliance with customers’ quality and safety requirements, which are directly expressed in the market or in the respective legislation.

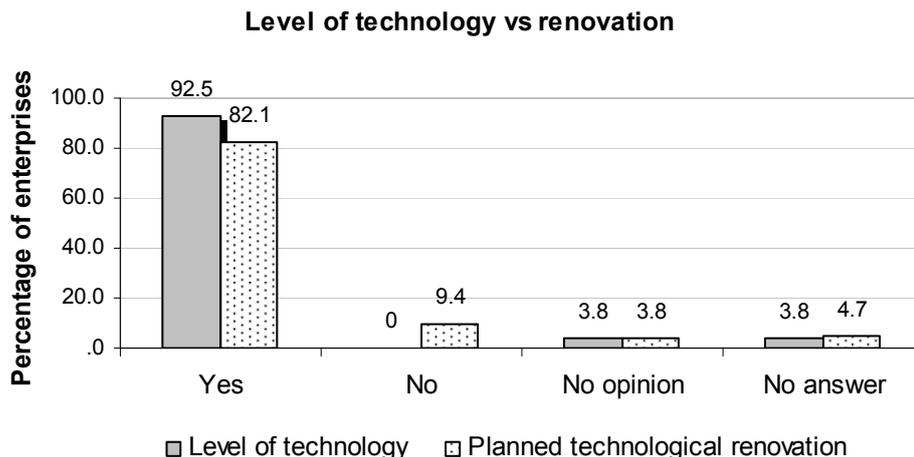
In this section of the questionnaire, the first question discusses the level of technology that enterprises use as it relates to product quality and safety requirements.



**Figure 5-19. FBE reflection of product and safety requirement fulfillment in their technology, Questionnaire 2009**

Results revealed that 92% of FBE who participated in this question stated that the existing level of technology that they use in the manufacturing process reflect product quality and safety requirements required in the market and by Albanian legislation. On the other hand, only 4% of FBE stated “No opinion” and “No answer”. None of them stated any compliance between technology used and product’ quality and safety requirements.

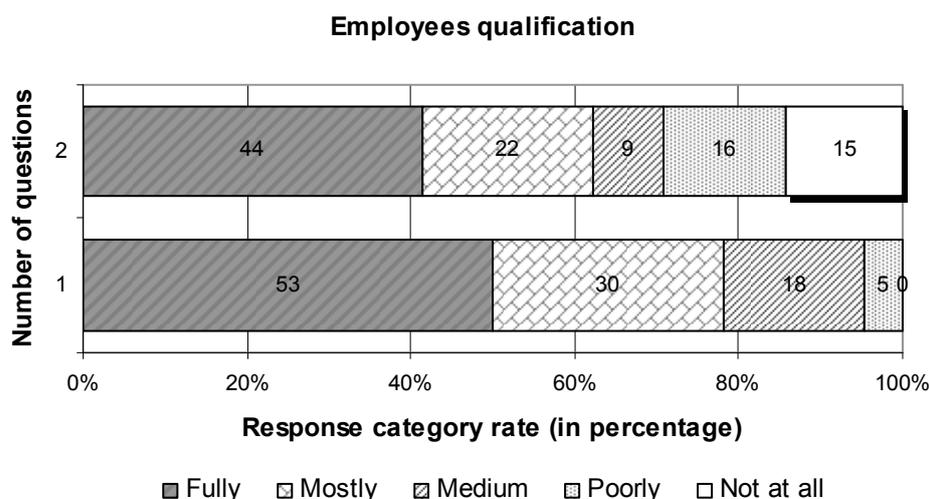
Figure 5-20 shows the level of existing technology in compliance aggregated together with products’ quality and safety and plans for technology renovation. To be specific, 92% of the enterprises said that their production technology is in compliance with quality and safety requirements, Moreover, 82% of the FBE also stated that they have plans for technological renovation, whereas the rest of this group (around 9%) have no plans in this regard. Moreover, 3.8% and 4.7% gave “No opinion” and “No answer”, respectively.



**Figure 5-20. The level of existing technology in compliance by FBE compared with FBE products’ quality and safety and plans for technology renovation, Questionnaire 2009**

Alongside the importance of analyzing the technology process, another important element for the products quality and safety is also the qualification of the employees in the production level of technology. In this next section of the questionnaire, the aim was to investigate the level of qualification and knowledge of the production employees related to production technology. The following two questions (section A/IV in the questionnaire) were used:

1. Does the qualification of the employees respond to the level of existing technology?
2. Has the company planned internal trainings, organized and lead by its highly qualified staff, in the field of the production technique and technology?

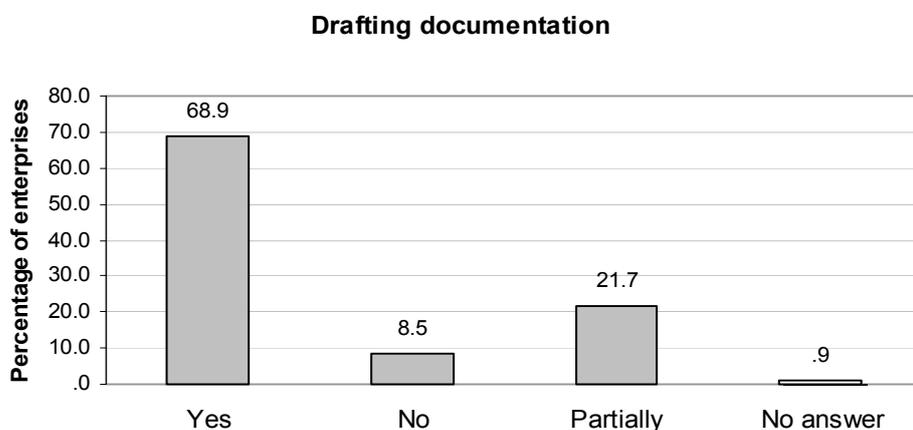


**Figure 5-21. Qualification of production employees and planned trainings regarding production techniques and technology, Questionnaire 2009**

Results from this section revealed that 53 FBE (50%) admitted full compliance of the employees' qualifications with the level of existing production technology. The other 30 enterprises (28%) believe that the level of employees' qualifications is "mostly" in compliance with the level of existing technology, whereas 23 enterprises (22%) believe that compliance between these two levels is "Medium" or "Poor".

Regarding question number 2 from this section, only 44 enterprises (42%) have clear plans for the further training of their employees in the field of production technology (processing technology and packaging technology trainings), while 22 enterprises (21%) "mostly" have these plans for trainings. In addition, 9 (8%) and 16 (15%) enterprises have "Medium" and "Poor" plans (not clearly defined plans) for training, respectively; meanwhile, 15 enterprises (14%) did not answer this question at all.

The second part of this previous question included asking the FBE about the drafting of documentation about the production technology in the organization, also an important element in terms of assigning to every employee individual duties and responsibilities. Almost 69% of FBE included in the survey have drafted documentation about production technology while 8.5% of them have not drafted this documentation. Next, 21 FBE (7%) have partially drafted the documentation and only 0.9% of did not give an answer.



**Figure 5-22. FBE status regarding drafting the documentation about production technology in the organization, Questionnaire 2009**

**Key findings regarding production technology**

- Almost all FBE surveyed admit that their production technology responds to product quality and safety requirements.
- Despite the positive correlation between production technology and quality and safety requirement fulfillment, the majority of FBE also have plans for technological renovation.
- 50% of employees in the production sector have qualifications that meet the level of existing technology.
- More than 60% of FBE have clear plans for further training employees in the area of production technology.

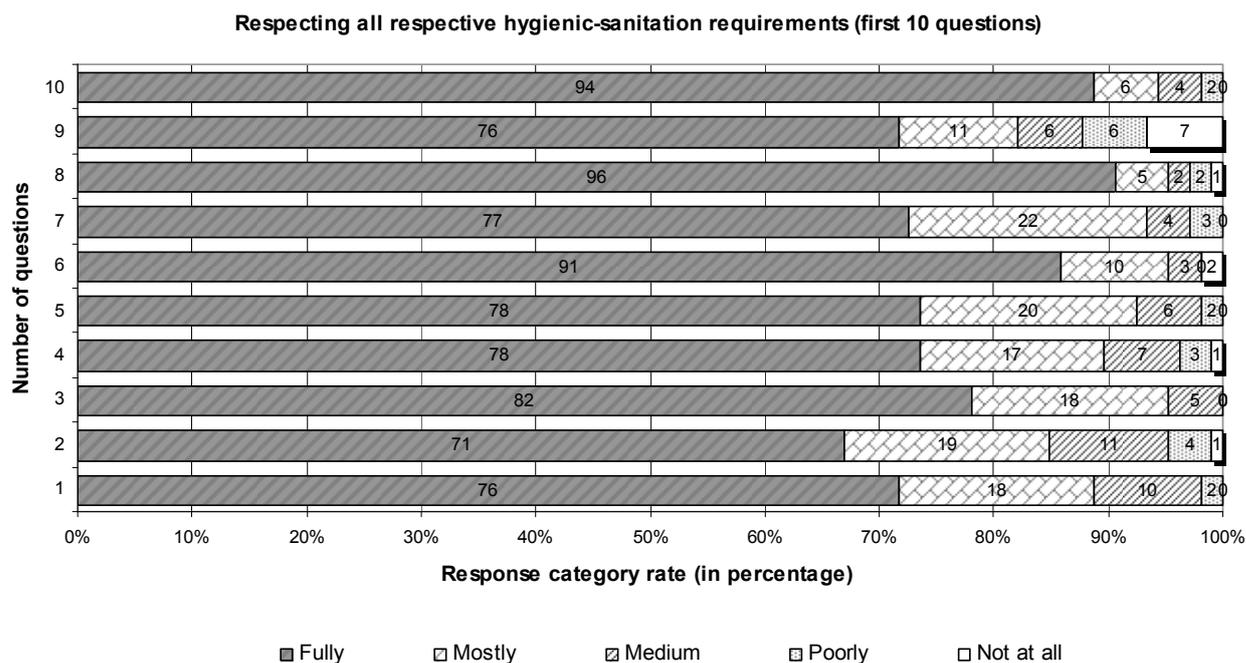
**5.1.9 Good management practices (GMP)**

One of the main activities in terms of quality management of FBE is the way that they deal with problems related to so-called “Good Management-Practices”; for example, the sanitation and hygiene problems within these enterprises. The high impact that these problems can have on product quality and safety (during product realization) makes them very important aspects to consider for the focus of quality management in the organization. In this section, the aim was to investigate these measures in the Food and Beverage industry.

The FBE responses to the following questions are shown in Figure 5-23 (section A/VI in the questionnaire). The questions to this section were as follows:

1. Is the construction of the building for producing/storing the products appropriate in relation to the organization’s hygienic-sanitation requirements?
2. Do these requirements include if a garbage disposal provided proper allocation of garbage containers determined and the drainage system around the building and their cleaning clearly designated and scheduled?
3. Do measures exist to avoid leaking points? To be specific, is there regular monitoring of the pipes system and discharge of the water from the terrace/roof?
4. Are the doors and the windows of the production/packaging sectors in proper condition? To be specific, are they closed (subsequent proper isolation provided) with an automatic closing mechanism that has nets or plastic belts?
5. Are the ceilings, walls and floors of the production/packaging sectors made of materials that can be easily washed?

6. Does the organization provide an environment that is without the presence of insects, rodents, etc. in the production/packaging sectors?
7. Is there a proper ventilation system that exists in the production/packaging sectors?
8. Is there a proper lightening system that exists in the production/packaging sectors?
9. Are there proper infestation prevention/control vessels at the entrance of the production/packaging sectors?
10. Do the workers have appropriate toilets (undamaged and clean)?



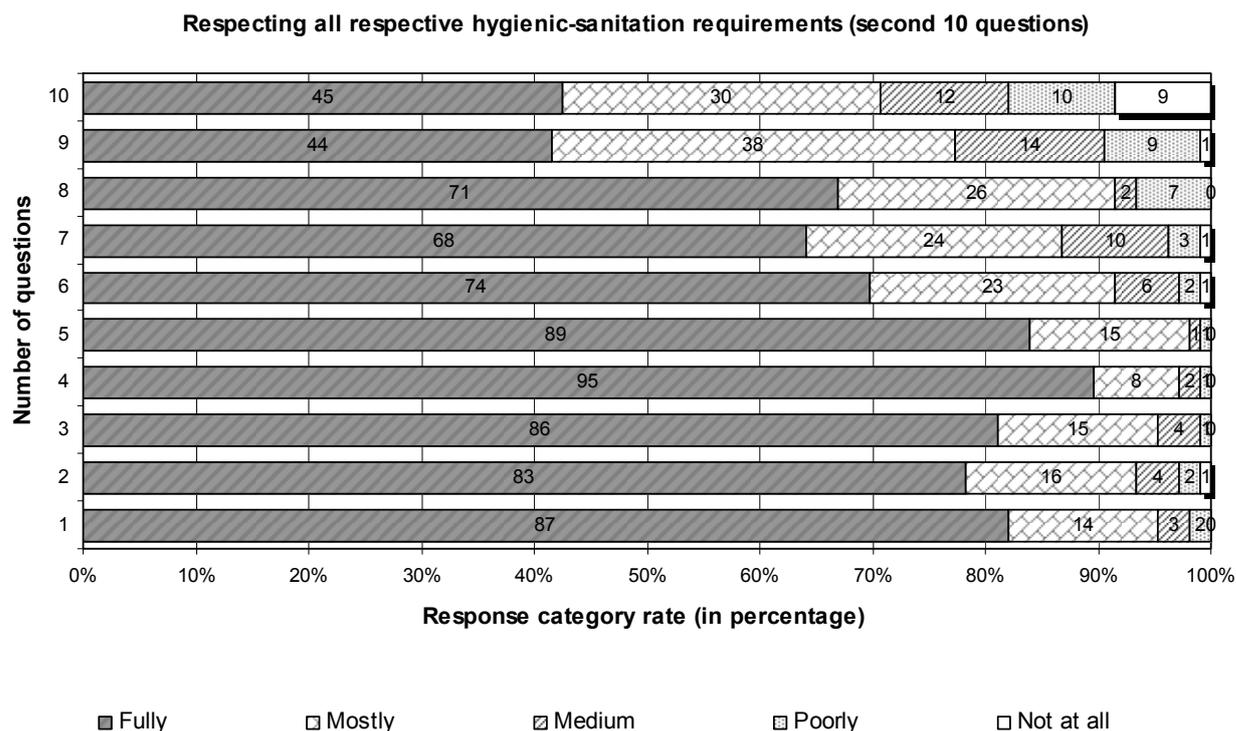
**Figure 5-23. FBE responses regarding fulfillments of specific hygienic-sanitation requirements of their organization (first 10 questions), Questionnaire 2009**

Generally speaking, the majority of FBE who participated in this section respect the respective (dependent to subsector of food and beverage industry where company is operating) hygienic-sanitation requirements. The share of enterprises that fully respect the aforementioned hygienic-sanitation requirements varies from 71 enterprises (67%) (referring to question number 2, which includes proper allocation of garbage containers and drainage system around the building) up to 96 enterprises (91%) (referring to question number 8, which includes proper lightning system in the production/packaging sector). On the other hand, 5 enterprises (5%) (referring to question number 8, which includes proper lightning system in the production/packaging sector) up to 22 enterprises (21%) (referring to question number 7, which includes proper ventilation system that exists in the production/packaging sectors) stated that they mostly respect the aforementioned hygienic-sanitation requirements.

Enterprises that had medium or poorly fulfilled requirements regarding the ten hygienic-sanitation requirements varies from 3 enterprise (nearly 3%) (referring to question number 6, which includes an environment in the enterprise without the presence of insects, rodents, etc. in the production/packaging sectors) up to 15 enterprises (14%) (referring to question number 2, which includes proper allocation of garbage containers and drainage system around the building).

The next 10 questions within this section (section A/VI in the questionnaire) discuss other elements of hygienic-sanitation requirements and were as follows:

1. Do the production/packaging sectors have sufficient sinks (undamaged, clean, with hot and cold water) and drying papers?
2. Does the production/packaging staff have the appropriate clothing that is clean and appropriate (apron, hood, etc.)?
3. Are there sufficient and appropriate dressing rooms for the employees of the production/packaging sectors?
4. Do the employees of the production/packaging sectors respect the hygienic-sanitation rules?
5. Are the cleaning, washing and the disinfections of the machineries and equipment of the production/packaging sectors properly done?
6. Are the hygienic-sanitation conditions fulfilled while accessing the raw material, packaging material, ingredients, disinfestations elements, etc. in the stores?
7. Is the quality of the water and the air in contact with the product controlled?
8. Is the documentation for the monitoring and controlling of the product's hygienic-sanitation conditions documented for the production/packaging process?
9. Are there fully respected hygienic-sanitation conditions in the transport vehicles used for distributing the products?
10. Are there fully respected hygienic-sanitation conditions in the outlets where the products of the company are being sold?

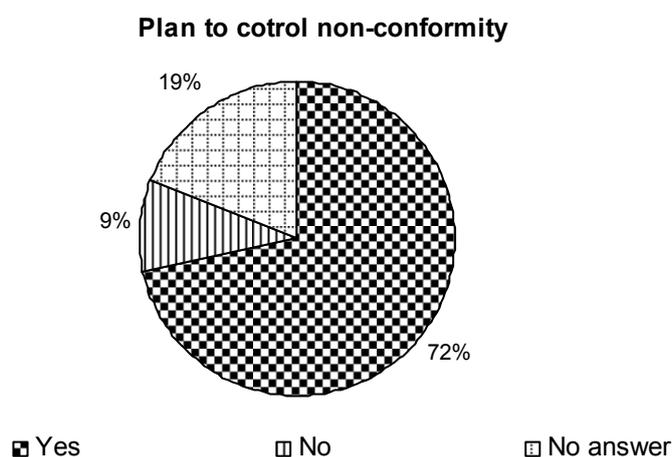


**Figure 5-24. FBE response regarding fulfillment of specific hygienic-sanitation requirements (second set of 10 questions), Questionnaire 2009**

The share of enterprises that fully respect the aforementioned hygienic-sanitation requirements varies from 44 enterprises (41.5%) (referring to question number 9 which includes hygienic-sanitation conditions in transport vehicles used in product distribution) up to 95 enterprises or approximately 90% (referring to question number 4 which includes the hygienic-sanitation conditions respected by the employees in the production sector). On the other hand, 8 enterprises (7.5%) (referring to question number 4 which includes the hygienic-sanitation conditions respected by the employees in the production sector ) up to 38 enterprises (36%) (referring to question number 9 which includes hygienic-sanitation conditions in transport vehicles used in product distribution ) stated that they mostly respect the aforementioned hygienic-sanitation requirements. Enterprises that had medium or poorly fulfilled requirements regarding the ten hygienic-sanitation requirements varies from 1 enterprise (nearly 1%) (referring to question number 5, which includes cleaning, washing and disinfection of equipment in the production sector) up to 23 enterprises (21.6%) (referring to question number 9, which includes hygienic-sanitation conditions in transport vehicles used in product distribution ). Only 1 enterprise did not give an answer for questions 2, 6, 7 and 9 while 9 (8%) enterprises did not give an answer for question number 10.

The last question of this section discusses the company's need to create a plan to keep under control the non-conformity of the products in the production process.

Question: Has the company created a plan or alternative, to keep under control the products that are not in conformity with standards?



**Figure 5-25. FBE response to the existence of a plan to control products that do not meet hygienic-sanitation standards, Questionnaire 2009**

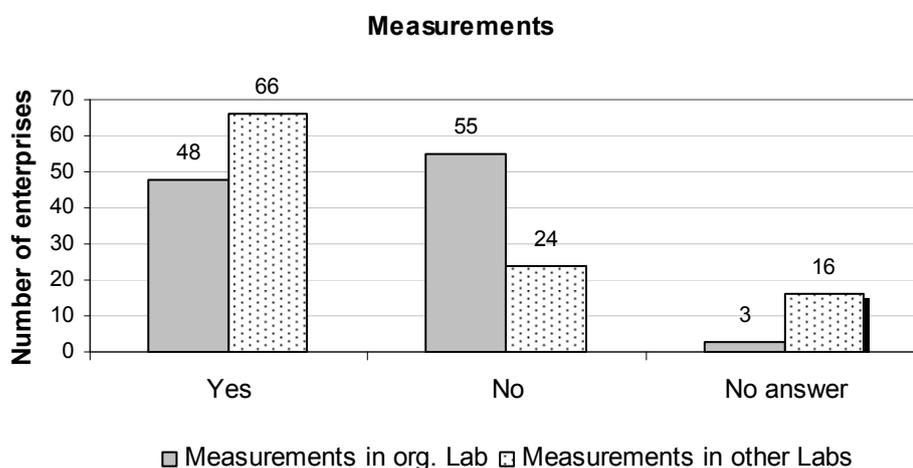
The majority of enterprises (72%) who responded to this question said “Yes” to the existence of a plan to keep under control the non-conformity of the products (Figure 5-25). In addition, 9% of them stated that they do not have a plan and 19% of enterprises did not answer the question at all.

**Key findings regarding GMP**

- Approximately 90% of FBE declared that they fully or mostly respect the hygienic-sanitation conditions, stated in Albanian legislation on food.
- The majority of FBE have developed a plan to control and address non-conformity of products.
- 9% of FBE do not have a non-conformity plan for their products, arising some concern and need for further investigation in this matter.

### 5.1.10 Quality and safety control of the food products

To carry out the measurement and control of the quality and safety of the products in compliance with the technical specifications, enterprises need a specialized team for this matter. To illustrate, this team may be represented by one person or by a number of persons within a framework of a quality control sector (relevant mainly in medium and large scale enterprises). The quality control sector in food enterprises, alongside with measurement and control of quality, can also deal with non-compliant products. This sector may perform their objectives utilizing inspectors and lab technicians for measuring (analysis) and controlling instruments in the laboratory of the enterprise.



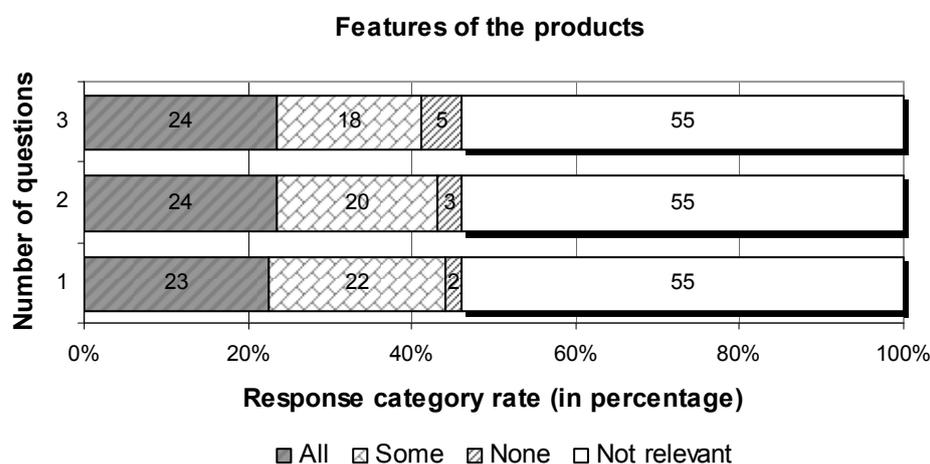
**Figure 5-26. Measurements of technical specifications in company lab vs. measurement in other labs, Questionnaire 2009**

Based on the results for this question, 48 enterprises (45%), of those enterprises who were asked about measurements in the labs, stated that they do the measurements in the company lab, while 55 of them (52%) do not do the measurements in the company lab (because they do not have a laboratory in the organization), and only 3 enterprises (around 3%) did not give an answer (Figure 5-26). On the other hand, 66 enterprises out of 106 (62%) carry out the measurements in other labs, whereas 24 of them (23%) do not do quality and safety measurements in other labs. Last, 16 enterprises did not give an answer.

Generally, all FBE who responded to this question, measured the characteristics of their products either in their own labs or in a third party lab (114 total), while some of them (8 enterprises) use both, their own labs and other labs to measure product characteristics.

The aforementioned forms of quality control are regulated by the relevant technical specifications based on the documentation previously discussed (Section 5.1.7, “Technical specification- standards of the food and beverage products”). This is drafted by the Research & Development sector, which in the case of food and beverage products includes the three groups of characteristics: organo-leptic (sensory), physical-chemical and microbiological. The next three questions in this section (section A/VII in the questionnaire) discuss the kind of features measured in the lab and to what extent they measure these features.

1. How many organo-leptic features are measured?
2. How many physical-chemical features are measured?
3. How many micro-biological features are measured?

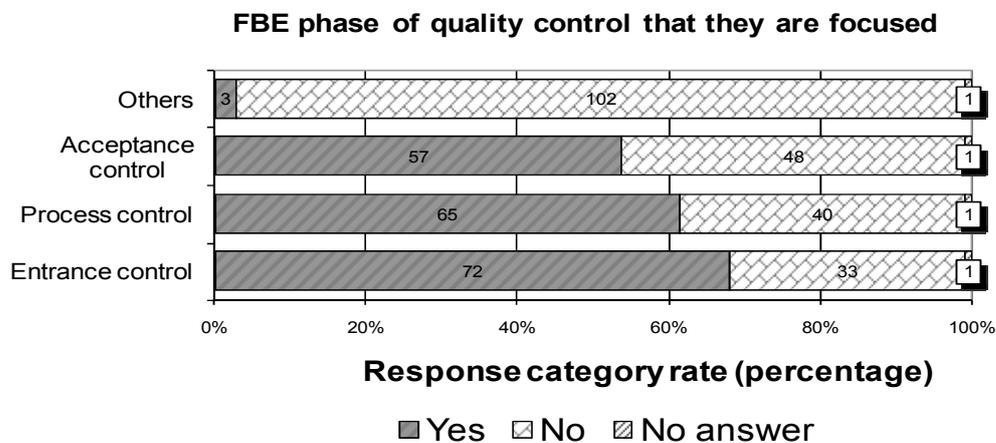


**Figure 5-27. Features of the products and the extent that they measure, Questionnaire 2009**

According to Figure 5-27, results reveal similarities across all three questions. To be specific,, 23 to 24 enterprises (22%) admit to measuring all organo-leptic, physical-chemical and micro-biological characteristics of the product in the lab, whereas 22 enterprises (21%), 20 (19%) and 16 (15%) measure some organo-leptic, physical-chemical and micro-biological features, respectively. What is of concern from these results is that a number of enterprises (55) judged measuring the characteristics of the products as no relevant for their product (this applies across all three questions).

At present, structure of quality control entails the quality control at entrance (control of raw materials and cooperation for their storage according to the rules), control during the production process (control of operational stages) and control at the final process (control of

acceptance of products and cooperation storage according to the rules). For the following part, FBE enterprises were asked to state in which phase of quality control they are focused (Figure 5-28).



**Figure 5-28. Quality control stages that the company is focused on, Questionnaire 2009**

According to Figure 5-28, 72 enterprises (68%) focus on entrance control, while 33 of them (28%) do not focus in entrance control as a phase of overall quality control. Regarding process control, it turns out that 65 enterprises (61%) focus on it while 40 enterprises (39%) do not. In regards to acceptance control of finished products, 57 enterprises (54%) are focused and 48 (46%) do not focus at this phase of quality control. Only 3 (3%) of FBE stated that they focus on other measures of quality control without mentioning the specific measures they focus on (perhaps they focus on measures that belong to the aforementioned phases but are not able to distinguish to which phase they belong to), and 102 of them (approximately 97%) do not focus on other measures in context of quality control. Only one enterprise for each question gave no answer.

Lab employees, or persons employed on quality control activities, in FBE must meet minimum knowledge and qualification standards such as a university degree in specific areas of education. In this part of the questionnaire, FBE were asked about the level of knowledge their lab employees have. Based on the FBE enterprises who participated in this section, it was been found that (based on enterprises evaluation) 25% of the enterprises think that the qualification of their employees is high, 19% think qualification is medium, 3% of them think qualification is low and 44% stated qualifications of their lab employees is not relevant. Approximately 9% of FBE did not answer the question.

Based on the results, the average number of employees employed in the production sector is 10.6 with a minimum of 2 (corresponding to micro or family owned FBE) and a maximum of 145 employees (corresponding to medium and large scale FBE). Regarding the number of employees employed in quality control, the average number is 2.4 employees with a minimum of 1 employee and maximum of 15 employees. Lastly, FBE were asked to what extent they address problems related to quality and safety of non-compliant products after conducting quality control within their enterprise or after introducing products to the market.

Results revealed that 55% of FBE who participated in this section, stated they address the problems of non-compliance of the products, while 13% of FBE stated that they do not address these problems. The other 30% of the enterprises sometimes address the issues of non-compliant products and approximately 2% of FBE gave no answer.

### **Key findings on quality and safety control of food and beverage products**

- More than half of FBE do not have the lab facilities for measuring characteristics of the products.
- Nearly one fifth of FBE in the survey measure all organo-leptic, physical-chemical and micro-biological features.
- Based on the results, of concern is that half of the enterprises declared that measuring of these characteristics in their case is not relevant.
- Entrance control and process control represent the two stages of quality control that FBE are most concerned and focused.

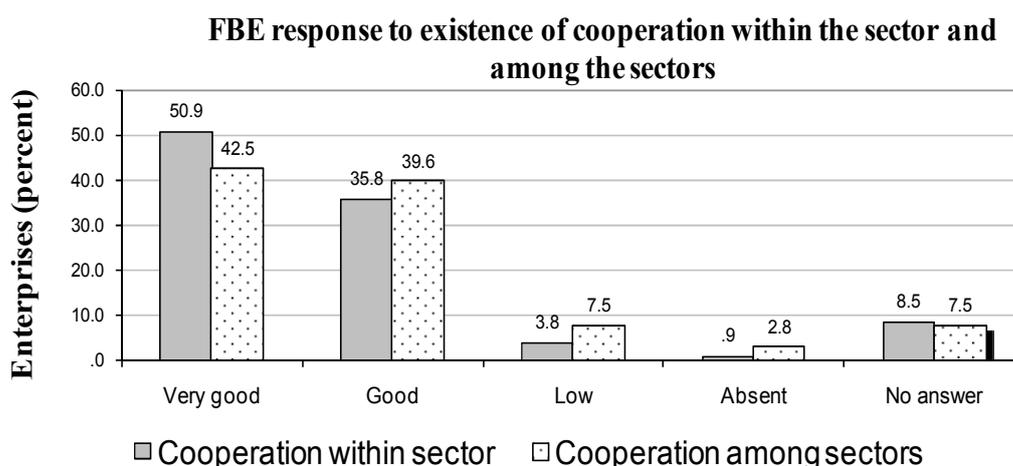
#### **5.1.11 Human resources in the Albanian food industry**

The extent of workers motivation and cooperation and the culture embodied in the enterprises are factors that influence the enterprises personnel in achieving the objectives set by the enterprise, and among them the objectives related to product quality and safety. Based on the results from the questionnaire for this section, it was determined that 62% of enterprises have motivated the employees working in significant stages of the production process with high salaries, while 34% of them stated that they sometimes motivate the same type of personnel with high salary. Only 2% of enterprises stated they do not motivate quality personnel with high salaries and 2% did not answer the question.



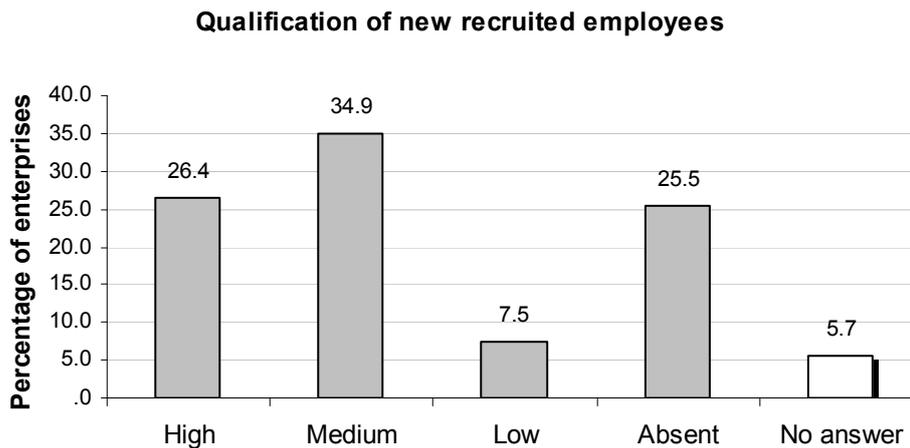
**Figure 5-29. Motivation of quality control personnel with high salary, Questionnaire 2009**

Regarding the results as they relate to sector cooperation, it is found that nearly 87% of the enterprises have very good or good cooperation within the sector, while 82% of them declare very good or good cooperation among sectors. A small % of enterprises in the survey (nearly 4% within the sector and nearly 8% among the sectors) declare that the cooperation within the sector is low, whereas a smaller % (nearly 1% within the sector and nearly 3% within the sectors) think that cooperation does not exist in their organization (see Figure 5-30). Approximately 9% (for cooperation within sector) and 8% (for cooperation among sectors) gave no answer to the question.



**Figure 5-30. Cooperation extent of personnel in the enterprise within and among the sectors, Questionnaire 2009**

The qualification level of employees in FBE is related to many factors such as: age, education, initial experience of the recruited individuals, technological level of experience with production, legislation and its implementation, in addition, technical and professional experience level as it relates to culture of management, enterprise's age, etc. The results shown in Figure 5-31 indicate the level of knowledge of newly recruited employees (last five years) in the field of quality and safety.



**Figure 5-31. Qualification of new recruited employees (last five years) in terms of quality management knowledge, Questionnaire 2009**

Based on the enterprises' responses, 26% of them believe that their newly (last five years) recruited employees have a high level of knowledge in the field of quality and safety. Approximately 35% of FBE believe that the level of knowledge of their newly recruited employees is medium. Next, the % of FBE who selected the level of knowledge of newly recruited employees to be low or absent, accounted for 7.5% and 25.5% of results, respectively. Lastly 5.7% of FBE gave no answer to this question (based on discussion within the questionnaire, the majority of the 5.7% of FBE who selected the 'no answer' choice did so because they either were not present during the in depth interview of newly recruited employees or did not include the topic of product quality and safety knowledge during job interviews).

Training in the field of quality and safety is a crucial concept that must be incorporated in production and that requires continuous improvement. Based on questionnaire results, while 44% of FBE that have plans for training in production technology 3,78% of FBE actually express the willingness to invest on trainings related to quality and safety (Figure 5-32). On the other hand, 10% of FBE did not express the willingness to invest in such trainings. There

are also FBE that expressed partial willingness to invest on trainings related to quality and safety (4.7%), while the remaining FBE (6.6%) refused to give their opinion on the topic, “no answer”.



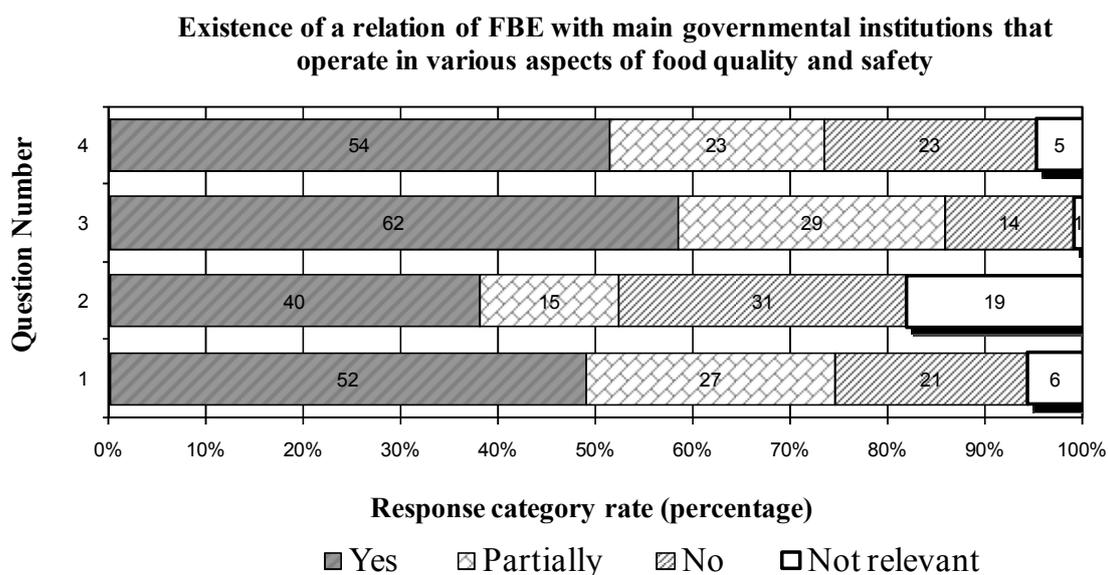
**Figure 5-32. Willingness of FBE to invest in trainings of the employees in the field of product’s quality and safety, Questionnaire 2009**

**Key findings regarding human resources in the Albanian food industry**

- Nearly all FBE motivate their quality control employees financially (high salary), on a regular basis.
- Cooperation between sectors or within sectors is found to be good or very good in more than 80% of FBE.
- Approximately 25% of enterprises stated that the qualification of newly recruited (last five years) employees in the field of quality and safety has been satisfactory or “medium”.
- Approximately 33% of participating enterprises stated that the qualification of newly recruited employees in the field of quality and safety is missing.
- Full willingness to invest on trainings related to quality and safety is expressed by more than 75% of enterprises.

## 5.2 Relation of FBE with main institutions in terms of quality and safety

The last set of questions in section A of the questionnaire concerns the relation of FBE with the main governmental institutions that operate in various aspects of food quality and safety ( MoAFCP, Commerce and industry Chamber, Veterinary Institute, etc.). In order to determine the products' quality and safety, the FBE need to collaborate and use materials and services from the main institutions that have experience, are qualified and experts regarding the problems of this field such as: the Hygiene and Epidemiology Institute (HEI), The Veterinary Institute (VI), the General Directorate for the Standardization (GDS) and the General Directorate of Metrology and Calibration (GDMC), just to name a few. Results for this set of questions are shown in Figure 5-33.



**Figure 5-33. Relation of FBE with main institutions in terms of product's quality and safety, Questionnaire 2009**

Questions (section A/IX in the questionnaire) investigating the relation of FBE with main institutions regarding products' quality and safety:

1. Are any materials or services used, in terms of quality and safety, from the Hygiene and Epidemiology Institute?
2. Are there any materials or services used, in terms of quality and safety, from the Veterinary Institute?

3. Are there any materials or services used, in terms of quality and safety, from the General Standardization Directorate?
4. Are there any materials or services used, in terms of quality and safety, from the General Directorate of Metrology and Calibration?

Generally speaking, FBE who participated in this section use materials and services from the four main institutions listed previously. Results revealed that 79 enterprises (75%) stated that they used materials and have received services from the Hygiene and Epidemiology Institute, while 21 enterprises (20%) stated no usage of materials or services from this institute. Considering the fact that the materials and services from the Hygiene and Epidemiology Institute are relevant for all enterprises operating in the food industry, 6 of them (approximately 6%) believe that these materials and services are not relevant in their case. Regarding question 2, specifically, 55 enterprises (52%) stated full usage of materials and services from the Veterinary Institute while 31 of them (29%) stated that they do not use materials and service from this institute, although these materials and services may be relevant to FBE. Moreover, 19 enterprises (18%) judge materials and services from the Veterinary Institute as not relevant for the nature of the activities that they carry out within their organization.

Question 3 provides a more optimistic picture in this regard. To illustrate, 91 FBE (85%) who participated in this section stated full or partial usage of materials and service (related to quality) from the General Directorate of Standardization. Only 14 enterprises (14%) do not use these materials and services from the GDS, whereas only 1 enterprise judges them as not relevant in their case.

For question number 4, Figure 5-33 shows 77 enterprises (73%) that have stated full or partial use of materials and services from the General Directorate of Metrology and Calibration, while 23 enterprises (22%) declared no usage of these materials and services from the GDMC. Lastly, 5 enterprises (nearly 5%) judged the materials and services from the GDMC as not relevant in their case.

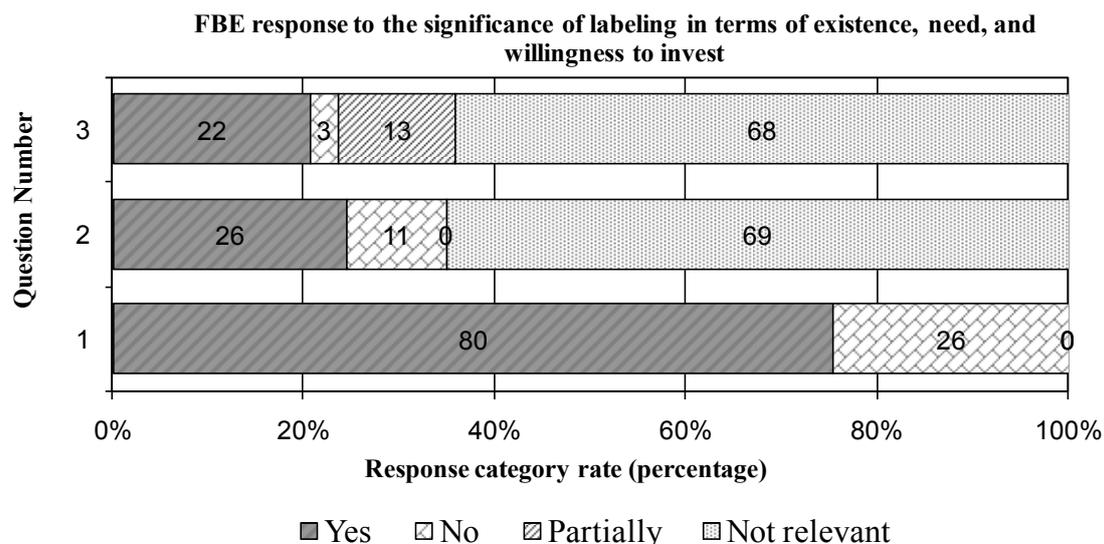
**Key findings on the relation of FBE with main institutions regarding product food quality and safety**

- FBE who participated in the questionnaire stated that they use mostly materials, related to quality and safety, provided by the following governmental institutions: HEI, GDS, GDMC and VI.
- 18% of FBE judged VI to be “not relevant” for the materials and services they provide, even if their work involves food and beverage products.
- Nearly 75% of FBE use mostly or to the full extent, materials and services provided by the GDMC.

### **5.2.1 Patenting/labeling of food products**

In all enterprises, food and non-food, the marketing function is an integral function of managerial activities in the organization, in addition to the production function. More specifically in FBE, communicating with customers through the marketing of products is a crucial approach for economic success (managerial point of view). Also, transmitting quality and safety precautions and measures to customers, through the labeling of the product is also a very important aspect to consider. Marketing is the main specialized “bridge” that assures the link between markets (customers) and the inner medium of the enterprise (source). As far as the quality and safety of products is concerned, labeling of the product of high importance.

Within the first three questions of this section (section A/I in the questionnaire) the aim was to investigate the existence of the labeling of food products in FBE, FBE beliefs of the need for the labeling of products and the willingness of FBE to invest for the patenting/labeling of products. In order to make these three aspects comparable, all responses by FBE for three questions were aggregated into one figure (Figure 5-34).



**Figure 5-34. Product labeling, need for labeling and willingness to invest for labeling among FBE in Albania, Questionnaire 2009**

1. Is the product of the enterprise patented/labeled?
2. Does the company feel the need for patenting/labeling the product?
3. Is the company willing to invest for patenting/labeling/relabeling (improving) of the product?

Based on this section of the questionnaire, 80 enterprises (75%) stated that their products were labeled, whereas the rest of them, 26 enterprises (25%) stated that their products were not labeled. For question number 2, regarding the company’s perspective on the need for labeling, it can be determined that of the enterprises that do not have their products labeled (26 enterprises), all feel the need for product labeling. Next, 11 enterprises of 80 enterprises (14%) that have their products labeled, do not feel the need for label improvement; whereas the remaining 69 enterprises (86%) believe that there is a need for improving product labeling. The third questions regarding the enterprise’s willingness to invest on the labeling of the products revealed that 22 enterprises out of 106 (nearly 21%) included in the questionnaire, expressed the willingness to invest on relabeling or label improvement for their products. On the other hand, 3 enterprises expressed no willingness to invest. Next, 13 enterprises (12%) expressed partial willingness to invest on labeling and the remaining 68 enterprises (64%), judged willingness to invest on labeling as not relevant in their case (representing the group of enterprises that have their products labeled).

The certification of the food products and beverages as a proof of reliability in the market shows the compliancy of the products characteristics with the requirements of the respective standard. The certification can be of national or international recognition.

Continuing with this section, enterprises were asked if they have their products certified or not. Almost all of them (99.5%) stated that their products are certified and only one of them said they did not . Results for the standard used in product certification and the effects from this certification are shown in Table 5-1 below.

**Table 5-1. Standards used in product certification and the respective effects from certification, Questionnaire 2009**

		<i>Effects of product certification</i>					
		<b>High</b>		<b>Low</b>		<b>No effects</b>	
		Count	Row N %	Count	Row N %	Count	Row N %
<i>Standard in product certification</i>	<b>Albanian</b>	56	73.7%	14	18.4%	6	7.9%
	<b>Foreign</b>	17	89.5%	2	10.5%	0	.0%
	<b>Both</b>	3	100.0%	0	.0%	0	.0%
	<b>Not relevant</b>	0	.0%	0	.0%	1	100.0%

The majority of FBE (76 enterprises or 72%) who participated in this section of the questionnaire stated that they used Albanian standards for product certification. Within this group of 76 enterprises, 73.7% believe that the positive effects from this certification have been high, 18.4% believe that the positive effects have been low and 7.9% of this group believe that there are no positive effects from this certification. On the other hand, 19 enterprises (18%) who participated in this section stated that they used foreign standards for product certification. Within this group of 19 enterprises, 89.5% of FBE confirmed high positive effects from certification, whereas 10.5% of them confirmed low positive effects from certification. Furthermore, only 3 enterprises (nearly 3%) have used both standards (Albanian and foreign) in product certification and all believe that there are high positive effects from certification. Lastly, 1 enterprise (1%) judged the question as not relevant and 7 enterprises (16%) did not answer the question (not indicated in Table 5-1).

Further in this section, FBE were asked for duration of the product certification (months) and the amount of money they paid (cost) for product certification. Based on the results, the

average product certification resulted to be 6.54 months with a minimum of 1 and maximum of 16 months. Next, regarding the amount of money paid for certification, the average amount paid by FBE was 389 256 ALL (approximately € 3000<sup>1</sup>) with a minimum of 10 000 ALL (approximately € 90) and a maximum of 5 000 000 ALL (approximately € 3850).

FBE who participate in this section also shared a number of positive effects regarding product certification such as strengthening of firm reputation, gaining consumer confidence, consumer loyalty, ensuring product credibility, more responsibility towards customers, high quality products demanded, increase in sales, marketing improvement, increased product quality and safety and increased brand loyalty.

### **Key findings regarding patenting/labeling of products**

- 75% of FBE have their products labeled, and of this group, 75% feel the need for investing for label improvement or relabeling.
- On the other hand, about 33% of FBE do not have their products labeled and of that group, 100% agree to the need for labeling.
- Only 21% of enterprises express the willingness to invest for labeling.
- Almost all FBE have their products certified using Albanian standards (72%), foreign standards (18%) or both (3%).
- The average duration for product certification is 6, 54 month (dependent on the size of the enterprise).
- The average amount of money paid for product certification is € 3000.

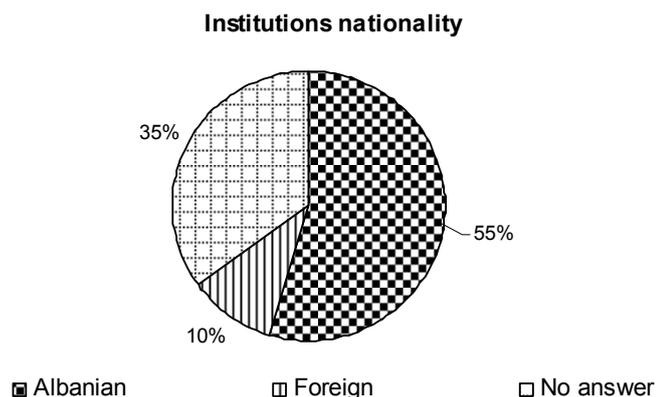
### **5.2.2 Bodies/Institutions of product certification**

The level of the recognition of the certification depends primarily on the level of the standard (Albanian or international), what the certification is for, and the nationality of the certification agency (Albanian or foreign). Figure 5-35 reveals the results drawn from this section of the questionnaire.

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<sup>1</sup> Exchange rate for calculations in EURO; 1 ALL = 0.0072135 EURO / 02/12/10

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**Figure 5-35. Nationality of institutions contracted for product certification, Questionnaire 2009**

Based on the results, 55% of FBE used Albanian agencies/institutions in the process of product certification, while 10% of them used foreign agencies/institutions. A relatively large percentage of enterprises (35%) did not give an answer to this question, “no answer”. This group of “no answer” enterprises mainly represented the exporting FBE (dominated by medium and large scale firms) and those with foreign capital that had product certification from internationally recognized organizations.

Focusing on product certification, FBE were asked about the lab nationality where the analysis of their product was done. Based on their responses, 53% of FBE stated Albanian lab nationality, 8% stated foreign lab nationality, whereas 39% gave no answer. The next question in this section involves lab details (recognized or not). Results from this question revealed numbers that are not optimistic. To be specific while 63% stated that the lab where the analysis of the product is done is actually recognized, 2% said the lab is not recognized and a surprising 35% did not give an answer.

**Key findings regarding institutions of product certification**

- More than 50% of FBE used Albanian agencies for product certification and only 10% of them used foreign agencies.
- Also, more than 50% of FBE stated that the analyses of their products were completed in domestic labs and 8% stated that they were done in foreign labs.

### **5.3 Appraisal of the quality management and quality assurance systems**

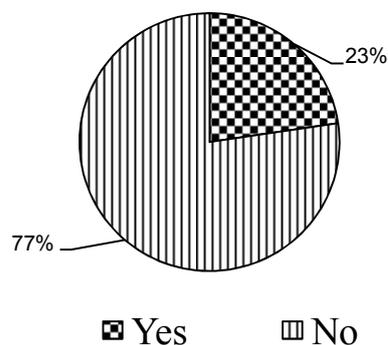
Management system certification requires a higher level of performance from FBE in all management activities; for example, consultancy on setting up and implementing the quality management system. The certification of this system is much more costly compared with product certification.

The importance of certification of the quality management system is that an enterprise adds value and increases the reliability of customers towards selecting products produced under certified management systems such as the ISO series or HACCP. Secondly, besides the enterprise and the consumer, the third party which plays a very important role from the technical and economic point of view of the process of certification, is the certifying body (certifying agency). It must be considered that it is the enterprise itself that has to cover all certification expenses (payment for consulting agency, expenses for arranging all the necessary steps in production, marketing management related to system requirements, etc.), which are considerable costs in the case of management system certification. The following two sub-chapters deal with the level of implementing quality management systems and consultancy for building up and implementing and certifying the system.

#### **5.3.1 System and enterprise status cognition**

There seems to be some interest considered in dealing with the implementation and certification of quality management systems (QMS) in FBE in Albania, as well as the attitude of the enterprises towards these systems. Hereafter, internationally recognized quality management standards such as ISO 9001, HACCP, or GMP will be referred to and mentioned.

**FBE response to the application of internationally recognized quality management standards**



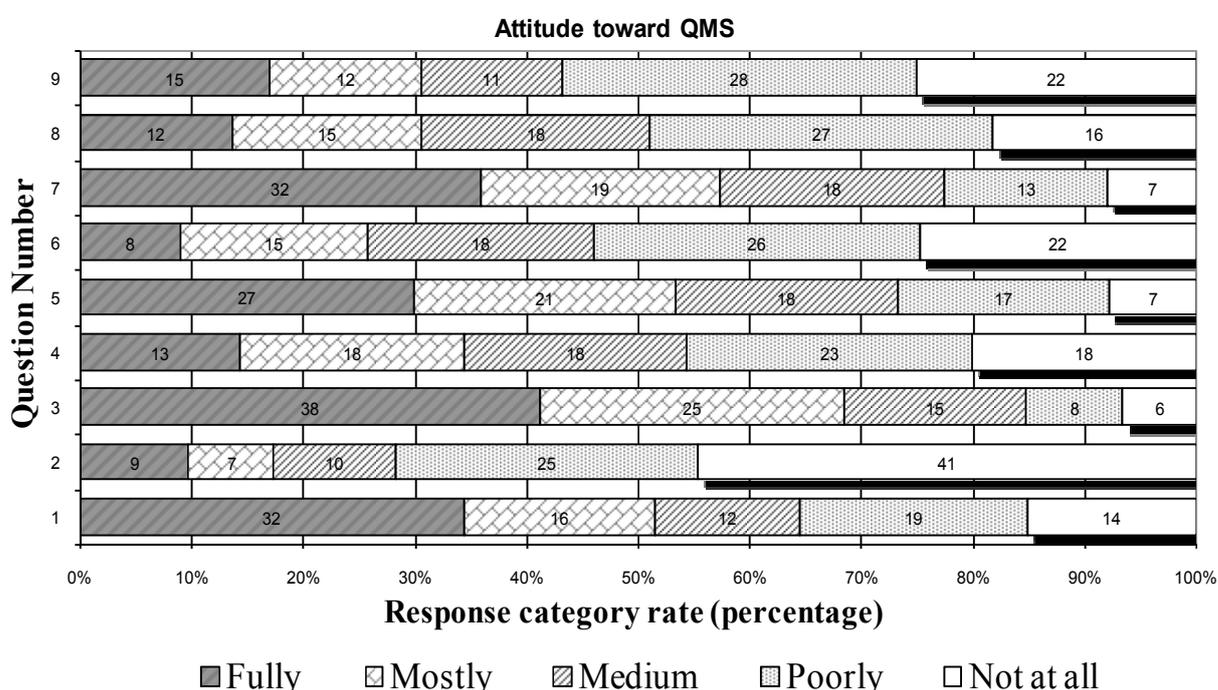
**Figure 5-36. Application of internationally recognized quality management standards, Questionnaire 2009**

Based on the results, Figure 5-36 reveals that 23% of all the enterprises have applied one of the mentioned quality management systems (ISO 9001, HACCP, or GMP), whereas the majority of FBE (77%) do not apply any of these quality management systems.

The following set of questions asks FBE about their attitude towards quality and safety management systems; to be specific, level of knowledge of the company about these systems, necessity for implementing these systems, is the preparedness of the company to implement these systems and willingness of the company to invest in implementation. Listed below are the questions used for this section (see section C/I of questionnaire) and the subsequent response rate for each question:

1. Is your company familiar with the standards applied in the “Quality management system ISO 9001”? (93 responses out of 106)
2. Is your company familiar with the “Assurance quality system HACCP”? (92 responses out of 106)
3. Do you consider it necessary to have “Quality management system ISO 9001” certification? (92 responses out of 106)
4. Do you consider it necessary to have the “Assurance quality system HACCP” certification? (90 responses out of 106)
5. Do you fulfill the requirements outlined by the “Quality management system ISO 9001”? (90 responses out of 106)

6. Do you fulfill the requirements of the “Assurance quality system HACCP”? (89 responses out of 106)
7. Are you willing to invest in certification of “Quality management system ISO 9001” standards? (89 responses out of 106)
8. Are you willing to invest in certification of “Assurance quality system HACCP” standards? (88 responses out of 106)
9. Are you willing to invest in certification combined management systems such as ISO 9001/HACCP? (88 responds out of 106)



**Figure 5-37. Attitude of food and beverage enterprises towards QMS certification and implementation, Questionnaire 2009**

Questions number 1 and 2 of this section investigate the levels of knowledge of the company about ISO series and HACCP. The results reveal that more companies know more about ISO series than HACCP; to be specific, 60 enterprises (56%) know ISO series fully mostly or at a medium level, while 26 enterprises (approximately 26%) know HACCP fully mostly or in at a medium level. On the other hand, 33 enterprises (31%) know a little or nothing about ISO series, whereas 66 enterprises (62%) know nothing about HACCP.

The attitude of FBE towards the need for implementing QMS (ISO and HACCP) is presented through questions number 3 and 4 of this section. Results for these questions revealed an

optimistic attitude in FBE regarding the necessity of implementing ISO series (78 enterprises or 74%) as a quality management system while only a small number of them (14 enterprises or 13%) considered the opposite, attitude that implementing ISO series is poor or not consider it at all.

For question numbers 5 and 6, FBE were asked to state if they fulfill the requirements of QMS (ISO series and HACCP). Based on the results, 66 enterprises (62%) stated fulfillment of requirements by ISO fully, mostly and medium level, while 41 of them (48%) fulfill these requirements at a poor level or do not fulfill them at all. Regarding requirements of HACCP (question 6), 41 FBE (48%) said that they fulfill these requirements fully, mostly or at a medium level, whereas 48 of them (45%) fulfilled these requirements at a poor level or do not fulfill them at all.

Based on the last three questions (6-9), indicated in Figure 5-37, the aim was to measure the willingness of FBE to invest in implementing ISO series and HACCP individually and together. Results show that 69 enterprises (65%), 48 enterprises (45%) and 38 enterprises (39%) have full, mostly or medium willingness to invest in implementing ISO series, HACCP and both of them, respectively. Lastly, 20 FBE (19%), 43 FBE (40%) and 50 FBE (47%) express very little or no willingness to invest in implementing ISO series, HACCP and both of them, respectively.

### **Key findings regarding quality management systems knowledge and implementation**

- Nearly 75% of FBE do not apply international quality management systems (ISO 9001, HACCP, and GMP).
- FBE are more familiar with ISO 9001 management systems than any other system, while one third and two thirds of FBE do not know anything about ISO series and HACCP, respectively.
- 75% of FBE believe that certification of ISO 9001 or HACCP quality management systems are necessary.
- Approximately 50% of FBE do not fulfill the requirements outlined by the ISO 9001 and HACCP quality management systems.
- More FBE expressed their willingness to invest in ISO 9001 than in HACCP, but also have the willingness to invest in both systems.

### **5.3.2 Consultancy for building up and implementing the quality management system**

Section C/II of the questionnaire discussed the nationality of consultant institutions for quality management system implementation. The results showed that for 9% of the enterprises (out of 106) the consultancy has been provided by an Albanian consultant institution, while for 8% was provided by a foreign consultant institution (in most cases Greek or Italian institutions). For 76% of the enterprises, this question was not relevant (they have not implemented QMS in their organization) and 6% of them did not answer the question. FBE were also asked about the duration of the implementation of QMS and the amount of money paid to the consultant institution. Based on the results, the average consultancy duration for building up and implementing the QMS is 8 months with a minimum of 1 month and a maximum of 28 months (for some medium and large scale enterprises) duration. In terms of money (considering FBE that have implemented the QMS), average consultancy services cost is 1 738 857 ALL (€ 12543<sup>2</sup>), with a minimum of 12 000 ALL (€ 85) for some enterprises and a maximum of 8 800 000 ALL (€ 63401) for others.

#### **Key findings regarding FBE consultancy agency for implementing QMS**

- 8% of consultancy for FBE regarding implementing QMS was provided by a foreign agency, while 9% of consultancy was provided by a domestic agency.
- Average consultancy duration is approximately 8 months (dependent on the enterprise).
- Average expenses for system consultancy are €12543 (dependent on the nature and size of the enterprises).

### **5.4 Appraisal over certification with respect to quality management and quality assurance systems**

After introducing the products in the market, the customer may demand the enterprise to guarantee the commercial quality of the product, specifically, they ask for high loyalty regarding the quality and the safety of the products in question. Today, this loyalty is

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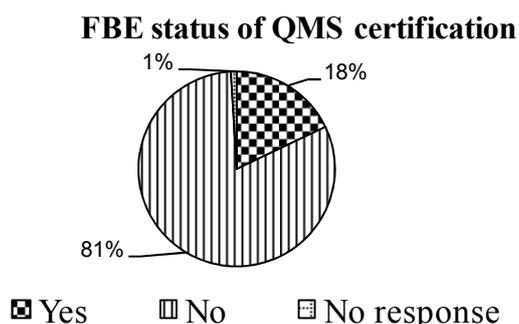
<sup>2</sup> Exchange rate for calculations in EURO; 1 ALL = 0.0072135 EURO / 02/12/10

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established through the certification of the product (an expression of the capacity or of the qualitative potential a processing enterprise has) and through the certification of the quality management system, which in the case of FBE would be the ISO 9001/HACCP integrated system (expression of the sustainability and the continuous improvement of the products quality and safety).

#### 5.4.1 Certification of a QMS

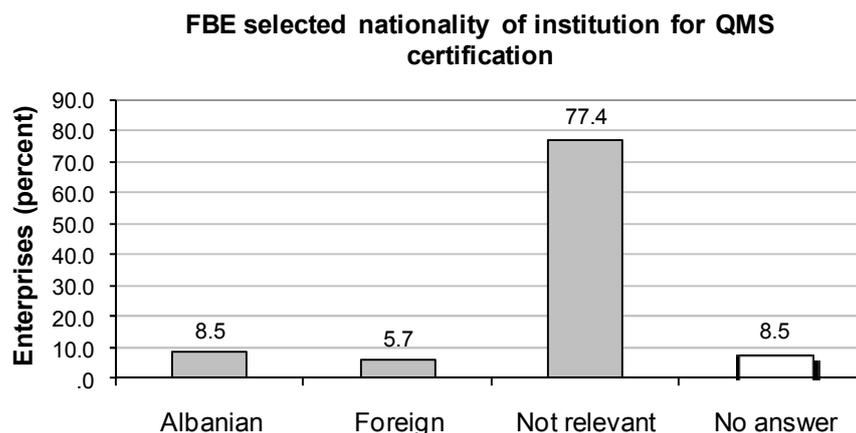
To get a clear picture regarding the level of certification of QMS (internationally recognized, ISO 9001, HACCP), FBE were asked, “Is your QMS certified?” Based on FBE who participated in this section, it was determined that only 18% of FBE are QMS certified and that the majority of them (81%) do not have certification for the quality management system. Only 1% of FBE did not answer the question.



**Figure 5-38. Certification of QMS among FBE, Questionnaire 2009**

The level of recognition of the certification depends primarily on the level of the standard (international, national) of which the certification is performed and on the nationality of the certification agency (Albanian or foreign).

Based on survey results (Figure 5-39), 8.5% of the internationally recognized QMS certifications have been completed by Albanian agencies (i.e. MoAFCP, districts Agricultural Directorates and some private certification agencies), whereas 5.7% of them have been completed by foreign agencies. For nearly 77% of the enterprises, this question is not relevant because they do not have a consolidated and well-defined quality management system established. Rather, it was mainly the exporting FBE and those with foreign capital that had certifications of international recognition



**Figure 5-39. Nationality of the institution used for QMS certification, Questionnaire 2009**

Another interesting discovery in this section is the view of FBE regarding the positive effects from quality management system certification. To illustrate, almost all enterprises that have their quality management system certification (95%) stated many positive effects from this certification, while the remaining FBE (5%) stated few positive effects. For the remaining participating FBE, this question was not relevant (they are not certified).

Based on questionnaire results, the average period of system certification is 7.2 months with a minimum of 1 month for some small and micro size enterprises and a maximum of 40 months for medium and large scale enterprises. The last two questions in this section are more sensitive based on enterprises' responses. FBE were asked about the amount of money paid to the consultancy institution for quality management system certification and the total cost of system certification. It resulted that the average amount of money paid to the consultancy institution was 566 166 ALL (€ 4031) with a minimum amount paid of 50 000 ALL (€ 356) and a maximum amount paid 2 232 000 (€ 15883). Regarding the total amount paid for certification of the quality management system, only 10 responses of 106 were received. Based on these 10 responses, the average cost was determined to be 822 700 ALL (€ 5854) while the minimum amount paid was 50 000 (€ 356) and the maximum amount was 4 000 000 ALL (€ 28 450). The maximum amount paid was based on the three large-scale enterprises' responses.

**Key findings regarding pre-established quality management system certification**

- A small number of FBE (18%) have QMS certification (ISO 9001, HACCP, or GMP).
- The majority of FBE (81%) either has not implemented the QMS or has not acquired certification.
- FBE use Albanian and foreign agencies to build up and implement QMS certification
- The average duration for QMS certification by a consultancy is 7.2 months (dependent on size of the enterprise).
- The average cost for to pay a consulting agency or institution for QMS certification is €4030 and the total average cost for QMS certification is €5854 (dependent on size and nature of the enterprise).

## **5.5 General information about the food and beverage enterprises in Albania**

In this section, the general information regarding the structure of the participating FBE was assimilated. General information included the age of enterprise and origin of initial capital (domestic, foreign or mixed) was determined. To understand the general size of the FBE, FBE were asked about the number of employees within their enterprise, their performance in financial terms (annual turnover) and about the ration export/annual turnover. Sub-sectors within the FBE themselves were also determined.

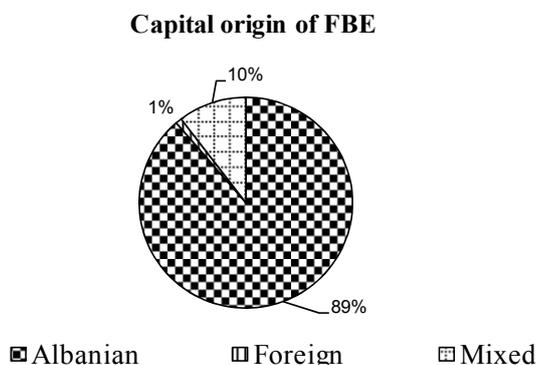
Another aspect incorporated in the general information of the FBE was the enterprises' human capital. By considering the training on human capital as an important element of quality management for enterprises, FBE were asked what they had done in terms of training of human capital on issues related to different areas of general management such as product quality and safety, production technology, marketing and in the area of quality management. Lastly, when enterprises were asked about the level of education of their employees, FBE responded that they had highly educated employees (workers and managers).

### **5.5.1 Structural information about food and beverage enterprises**

It is important to note that FBE in Albania are enterprises that are relatively new. Based on the questionnaire, results revealed that the majority of FBE (58%) were established between 1994 to 2000. To be specific, 23% of FBE were established between 2001 to 2007 and another 19% were founded from the years 1990 to 1993 (the first private enterprises in Albania were

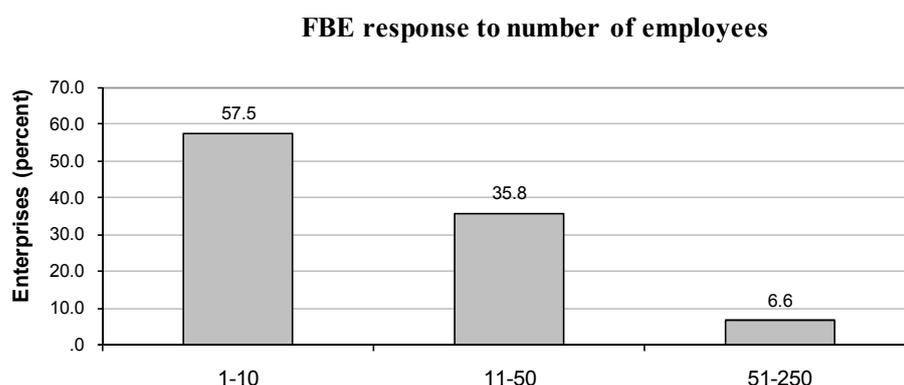
established in 1990, after communist system breakdown). It was determined that the average age of FBE in Albania is 12.2 years.

Moreover, 89% of FBE were established with Albanian capital, 10% with foreign capital and only 1% established with mixed capital (Albanian and foreign).



**Figure 5-40. Origin of the initial capital of the FBE, Questionnaire 2009**

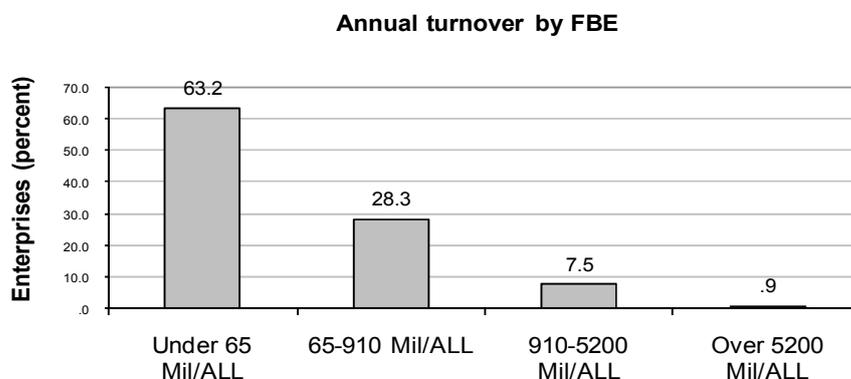
By using two indicators (number of employees and annual turnover), the aim was to investigate the size of the FBE who were participating. Based on the analysis of the results, it was found that 57.5% of enterprises have 1 to 10 employees, nearly 36% of them have 11-50 employees and the remaining 7% of enterprises have 51-250 employees (Figure 5-41). None of the FBE had more than 250 employees.



**Figure 5-41. Number of employees in the food and beverage enterprises in Albania, Questionnaire 2009**

Furthermore, the annual turnover of FBE is relatively low (Figure 5-42). To illustrate, approximately 64% of the enterprises have an annual turnover of up to 65 Mil (ALL), approximately 28% have an annual turnover (65 – 910) Mil (ALL) and nearly 8% of the

enterprises have an annual turnover of (910 – 5200) Mil (ALL). Only about 1% of the enterprises surveyed had an annual turnover of over 5200 Mil (ALL).



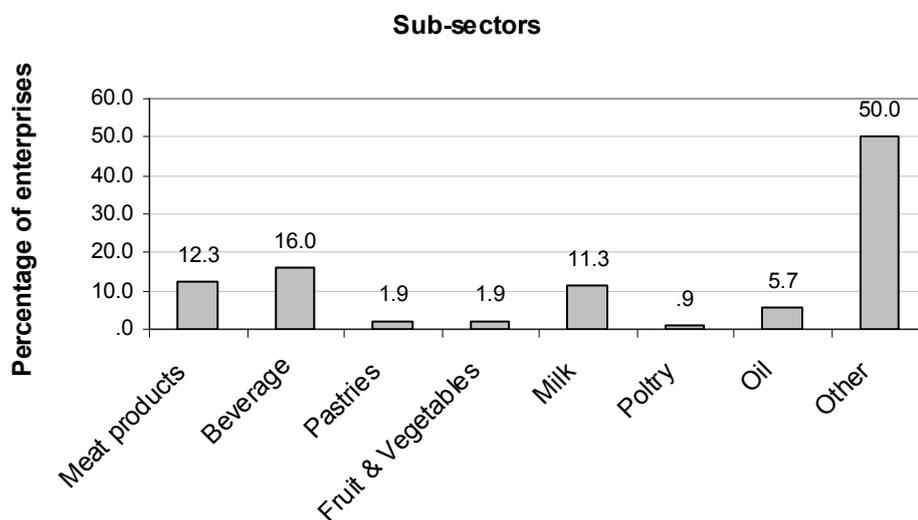
**Figure 5-42. Annual turnover of food and beverage enterprises in 2008, Questionnaire 2009**

The export of food and beverage products continues to be a challenging issue for FBE. In order to properly investigate this issue, the size of the enterprise must be considered. In major parts of the enterprises, the level of exports is low; to be specific, 49% of enterprises have an annual export turnover ratio of under 10%, nearly 8% of them have a ration of 10% to 30% and approximately 3% have a ration of an annual export turnover of over 50% (Figure 5-43). According to the last bar on the graph (Figure 5-43), nearly 32% of the participating enterprises do not export at all. It is important to note that export of products is mainly to the neighboring countries i.e such as Macedonia, Montenegro, Greece and especially Kosova.



**Figure 5-43. Percentage of export to enterprises annual turnover, Questionnaire 2009**

Conducting the study within the food and beverage industry in Albania means that different subsectors participated such as the meat, beverage, pastries, fruit and vegetable processing, milk, poultry, oil sector and others. Sub-sector distribution of FBE who participated in the study is shown in Figure 5-44.



**Figure 5-44. Distribution of enterprises according to sub-sectors, Questionnaire 2009**

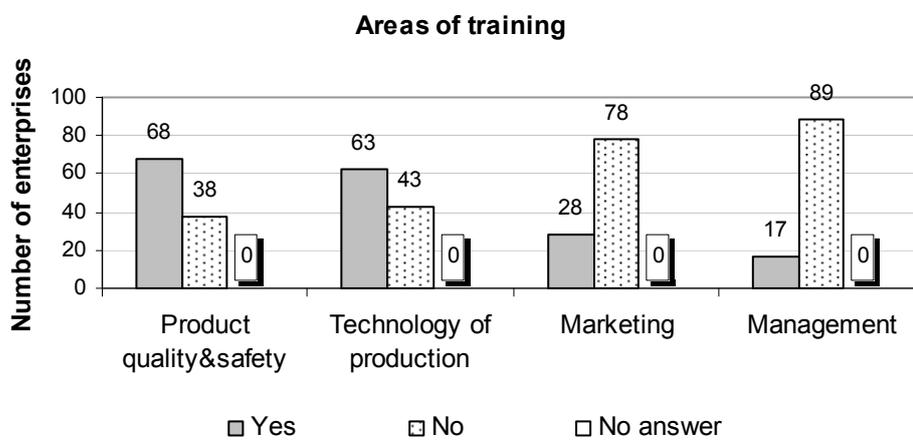
According to Figure 5-44, approximately 12% were in the meat processing sub-sector, 16% of them in the beverage products sector, nearly 2% were within the pastries and fruit and vegetable processing sub-sector, 11% belonged to the milk processing sub-sector, nearly 1% in the poultry sector, approximately 6% in the to oil sector and 50% of them belonged to other food and beverage industry sub sectors (flour production sector, bread sector etc).

**Key findings regarding FBE structure**

- The FBE in Albania are relatively new, between 10 to 15 years.
- The initial capital in approximately 90% of FBE is domestic and for the remaining 10%, the initial capital is mixed (domestic and foreign).
- The food and beverage sector in Albania is dominated by micro and small scale enterprises (1-10 and 11-50 employees, respectively).
- Based on annual turnover, more than 63% of FBE have an annual turnover of less than 65 Mil/ALL.
- Revenue from export accounts for less than 10% of total revenue for the majority of FBE that export. The majority of FBE operate in domestic markets with some exceptions (i.e. a small number operate in domestic and regional markets).

### 5.5.2 Human capital training and education

In this section, enterprises were asked about the areas of activities where they have completed trainings. Based on the results from this section, 64% (68 enterprises) of FBE have completed trainings in the field of product quality and safety (i.e. hired qualified people/organizations for training seminars in the enterprises or have participated in training seminars organized by specialized organizations), while 36% (38 enterprises) of them declared no participation in training seminars. In the area of production technology, 59% (63 enterprises) of FBE have trained their employees, while 41% (43 enterprises) have not completed training in this area. When reviewing the results on marketing and management for this section, it is more pessimistic compared with the two previous areas discussed. To illustrate, in the area of marketing, approximately 26% (28 enterprises) of FBE have completed some form of training in marketing, whereas 74% (78 enterprises) have not completed any training in this area. In the area of management, 16% (17 enterprises) of FBE surveyed have completed trainings while the majority of enterprises (84%) have not completed any training in terms of management with respect to product quality and safety.



**Figure 5-45. FBE response to areas where they have completed trainings with respect to product’s quality and safety, Questionnaire 2009**

In this section, the aim was to identify the level of education of participating FBE’ staff (starting from the top of the staff hierarchy at management to the workers). Prior to meeting with the FBE, the education of enterprises’ management and staff was expected to be very important as they are at the forefront and have to be most up to date with current knowledge within the industry and implementing quality management systems. The following questions were used to determine the education of different management levels. Here are the questions:

1. What is the educational level of high level managers?

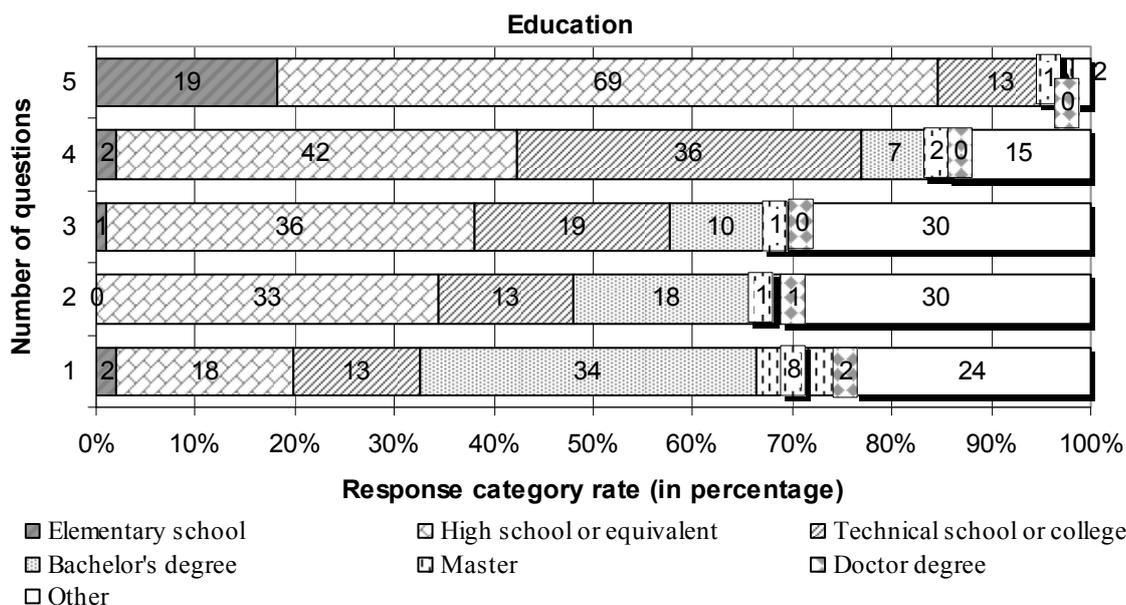
2. What is the educational level of medium level managers?
3. What is the educational level of high low managers?
4. What is the educational level of technical staff?
5. What is the educational level of workers?

Based on the results for question 1, it was found that the regarding the education of high level managers 2 enterprises' high level managers had only completed elementary school, 18 enterprises had high school or equivalent, 13 enterprises had technical school education and 34 enterprises had a bachelor degree. High level managers with a masters and/or doctorate degree were found in 8 and 2 enterprises, respectively. Last, 24 enterprises stated "other" for education level of their high level managers.

When comparing the results regarding education level of the high level managers with the medium level managers, results appear to be similar. To illustrate, for their medium level managers, 33 enterprises (34%) stated they had high school or equivalent, 13 (14%) enterprises had technical school education, 18 enterprises had a master's degree and only 1 enterprise had a doctorate degree. Lastly, 30 (31%) enterprises stated "other" for education level of their medium level managers. Regarding the education of low level managers (question number 3), 36 enterprises ( 37%) stated high school education, 19 enterprises (20%) stated technical school education, 10 enterprises (10%) stated a bachelor degree and 30 enterprises ( 31 %) stated "other" for education their level.

For question 4 regarding the technical staff, FBE responses revealed that 2 enterprises (approximately 2%) stated elementary school education, 42 enterprises (40%) stated high school education, and 36 enterprises (35%) stated technical school education for education level. On the other hand, when analyzing the frequency of higher degree education for technical staff, results reveal less frequency at this level of education by FBE. For example, only 7 enterprises (approximately 7%) stated having a bachelor degree, 2 enterprises (approximately 2%) had a master's degree and 15 enterprises (14%) stated "other" for their education level.

Based on the results for question 5, the education level of workers is mainly high school or equivalent accounting for 69 enterprises (66%). Elementary school accounted for 19 enterprises (18%) and technical school accounted for 13 enterprises (12%). Only 1 enterprise had workers with a bachelor degree. Last, 2 enterprises stated "other" for their workers education level.



**Figure 5-46. Education level of management staff, technical staff and workers in FBE, Questionnaire 2009**

**Key findings regarding FBE human capital and education**

- Nearly two third of FBE have completed training regarding product quality and safety, as well as marketing and management.
- In the areas of marketing and management, trainings appear to be less frequent (less than 25%).
- The education level of managerial staff (low to high) is mainly high school, technical school, and Bachelor degree or equivalent.
- Regarding workers and technical staff, levels of education are mainly high school and technical school or equivalent.

## **5.6 Influence of the different factors of the internal and external business environment on different aspects of quality management (utilizing regression analysis)**

As the previous chapters and subsequent sub sections provided a detailed description of the quality management systems and safety of products in the food and beverage industry in Albania, , this section focuses on utilizing ordinal logistic regression as a tool for answering the following research questions:

1. What are the factors influencing the extent of knowing and actually implementing Albanian legislation regarding product quality and safety and their subsequent effects?
2. What are the factors that influence the extent of knowing and implementing EU legislation regarding quality and safety and their subsequent effects?
3. How are the different integrated quality management systems affected by different factors belonging to the internal and external environment of the enterprise?

The Albanian legislation on quality and safety was selected as the dependent variable (ordinal variable) and four factors (listed below in the next page) were selected as the independent variables (can be any type of variable).

For the first research question, the dependent variable was the ‘Extent of knowing and implementing Albanian legislation about quality and safety of the food and beverage products’. As an ordinal variable, it was coded as the following: 1 = *Fully known*, 2 = *Mostly known*, 3 = *Medium known*, 4 = *Poorly known*, 5 = *Not known*.

In order to select the independent variable, a correlation matrix was utilized to determine if there was a correlation between the dependent and several independent variables and if there was, whether or not it was significant. To be specific, the idea behind selecting the independent variables was to test the specific variables that involve the information process at the macro level. In other words, the aim was to investigate how different aspects of informing activities (i.e. by the MoAFCP or other institutions) had subsequently impacted the level of knowing and implementing Albanian legislation on quality and safety in the food and

beverage industry in Albania, and also measuring the effect size. For this model, nine independent variables were tested in order to determine whether a correlation existed. Four correlations were found in which the correlation coefficient was determined to be significant ( $p < 0.05$ , or highly significant  $p < 0.01$ ). The four independent variables may be of any type; however, for this regression analysis, they are ordinal variables coded similar like dependent variable (1 = *Fully known*, 2 = *Mostly known*, 3 = *Medium known*, 4 = *Poorly known*, 5 = *Not known*).

The independent variables included:

- (a) How does the MoAFCP organize the informing process regarding food quality and safety legislation?
- (b) How does the MoAFCP organize the supply with documentation regarding food quality and safety legislation?
- (c) How does the MoAFCP organize the clarification in the seminars of the food quality and safety legislation?
- (d) How does the Directorate for Quality and Inspection in the MoAFCP conduct the inspection/observation of the food quality and safety?

For the second research question, the dependent variable selected was, ‘To what extent is the European legislation about food/ beverage products quality and safety known?’ As an ordinal variable, it was coded as: 1 = *Fully known*, 2 = *Mostly known*, 3 = *Medium known*, 4 = *Poorly known*, 5 = *Not known*.

The significance behind this particular research question is that as Albania is aiming to enter the EU markets in the upcoming years, Albania will have to fulfill the EU requirements regarding quality and safety of the food products to even be considered competitive. It is already a challenge for existing FBE operating in the EU food industry to survive in the EU’s open markets, let alone outside FBE considering entering the EU market in the near future. As such, it was determined to include an independent variable that considered the various aspects of activities coming from the internal business environment and dependent to organization management.

For this research question, another correlation matrix was developed to determine the presence of a correlation and its significance between the dependent and the various possible independents. After conducting the correlation, five independent variables were determined which all had a significant correlation with the dependent variable.

The independent variables selected were as follows:

- (a) Number of computers that are in operation in your organization (scale variable)
- (b) How many computers are connected to the internet (ordinal variable coded *1 = All, 2 = Mostly, 3 = Some, 4 = None of them*)
- (c) Annual turnover of the company in 2007 (ordinal variable coded *1 = Under 65, 2 = 65-910, 3 = 910 – 5200, 4 = Over 5200 in million ALL*)
- (d) Number of employees within the company (ordinal variable coded *1 = 1 -10, 2 = 11-50, 3 = 51-250, 4 = Over 250*)
- (e) Percentage of export in relation to the annual turnover of the company (interval variable coded *1 = Under 10%, 2 = 10% -30%, 3 = 31% - 50%, 4 = Over 50%, 5 = No export*)

**Table 5-2. Relationships between applying Albanian Law on standardization and different factors of institutional level (own calculation and data), Questionnaire 2009**

Al Law of Standardization	MoAFCP informing process (a)	MoAFCP supply with documentation (b)	MoAFCP certification seminars (c)	MoAFCP inspection (d)
Correlation Coefficient	0.202* <sup>3</sup>	0.231*	0.205*	0.271** <sup>4</sup>
Significance (2-tailed)	0.039	0.018	0.036	0.005
N	105	104	105	106
-2 Log-Likelihood	49.098	43.524	44.432	49.635
Chi-Square	8.130	8.451	8.087	11.155
Degrees of Freedom	3	3	3	3
Significance	0.043	0.038	0.044	0.011
Nagelkerke	0.081	0.084	0.080	0.108
Parameter Estimate	-1.285	-1.826	-1.501	-2.200
Wald Statistics	3.730	6.014	5.905	10.390
Significance	0.045	0.014	0.015	0.001
<b>Exp (b) Odds ratio</b>	0.276	0.16	0.223	0.111

a) Independent variable ‘MoAFCP informing process (a) parameter estimation is -1.285, representing a likelihood of lower dependent scores. If the predictor increases, this means that for the direction of the high scores, there is a decrease in the likelihood of scoring the lowest value (1) compared to the next higher level (2) in the dependent variable by a factor of 0.276.

b) Independent variable ‘Supply with documentation (b)’; parameter estimation is -1.826, this means a higher likelihood of scoring lower dependent values (1= Full extent of knowledge of Albanian legislation), or in other words if the predictor increases (means high scores in supply with documentation) the chances that the enterprises can score 1 compared to scoring 2 in the dependent variable, decreases by a factor of 0.16. Therefore, it comes to be very important

<sup>3</sup> Significant at 0.05 level

<sup>4</sup> Significant at 0.01 level

that MoAFCP supplies the documentation regarding the quality and safety of the products to the required level.

Conclusion: Supply of documentation from MoAFCP regarding the Albanian standard on quality and safety results in greater possibilities of implementing these standards from the food enterprises.

c) Independent variable 'MOAFCP information seminars (c)'; parameters estimate -1.501, this means a likelihood of scoring lower dependent values (1= Full extent of knowledge of Albanian legislation).

If the information workshops and seminars are not in the required level (increasing in the levels of independent), this decreases the chances of FBE knowing and implementing Albanian standards to the full extent by a factor of 0.223.

Conclusion: Information seminars and workshops organized by MoAFCP at the satisfactory level increase significantly the chances that the FBE knows and will implement quality standards.

d) Independent variable 'MoAFCP inspection (d)'; parameter estimate – 2.200, this means a likelihood of scoring lower dependent values. Similarly for the three other variables, increasing the independent variable (moving to the next higher level) decreases the chances of FBE knowing and implementing Albanian standards to the full extent by a factor of 0.111.

Nagelkerke coefficients vary from 0.080 to 0.108, representing weak effect sizes.

Conclusion: Enforcement practices such as that carried out by inspections must be conducted in a consistent and intensive manner to ensure that the enterprises in Albania's food industry have full knowledge and apply the Albanian Law on Standardization.

**Table 5-3. Relationships between Applying EU legislation regarding quality and safety of the food products and different factors inside the business environment (own calculation and data), Questionnaire 2009**

EU legislation	Computer Nr (a)	Connection to internet (b)	Annual turnover (2007) Mill. (c)	Nr. Of employees (d)	Export/ annual turnover (%) (e)
Correlation Coefficient	-0.387**	0.291**	-0.418**	-0.419**	0.247*
Significance (2-tailed)	0.000	0.003	0.000	0.000	0.015
N	104	104	106	106	96
-2 Log-Likelihood	74.809	60.267	33.940	33.257	45.734
Chi-Square	24.840	12.605	23.148	21.458	5.992
Degrees of Freedom	1	4	1	1	1
Significance	0.000	0.013	0.000	0.000	0.014
Nagelkerke	0.223	0.120	0.206	0.192	0.063
Parameter Estimate	-.326	-1.079	-1.428	-1.426	.241
Wald Statistics	12.728	4.770	18.625	18.318	5.886
Significance	0.000	0.029	0.000	0.000	0.015
<b>Exp (b) Odds ratio</b>	0.721	0.340	0.240	0.240	1.272

a) Independent variable ‘Number of computers in the company (a)’; parameters estimate - 0.326 (significant) which means that if the number of computers in the enterprises increases by one unit, than there is a decrease of 0.721 in the expected likelihood of moving to the higher scores for the dependent, or in other words, it decreases the chances of the FBE not knowing the EU legislation on quality and safety.

Conclusion: Increasing the number of computers in the company increases the FBE extent of knowing the EU legislation on quality and safety.

b) Independent variable ‘Connection to the internet (b)’; parameter estimate -1.079 (significant), this means that having all computers connected to the internet in the company is associated with the lower value in the ordinal dependent that is ‘Full knowledge’ about EU legislation regarding quality and safety

Conclusion: Establishing internet connection in the enterprises for all computers decreases the chances of FBE not knowing EU legislation by a factor of 0.340.

c) Independent variable 'Annual turnover (c)': parameters estimate -1.428 (significant), this means that if the annual turnover increases, this decreases the chances that the FBE do not have the full knowledge about EU legislation on quality and safety by a factor of 0.24.

Conclusion: Increasing annual turnover of the company by one unit decreases the chances of FBE not knowing the EU legislation on quality and safety.

d) Independent variable: 'Number of employees (d)'; parameters estimate -1.426 (significant), this means that if the number of employees increases, there is a higher likelihood of a lower value in the dependent score (1= Full knowledge of EU legislation on quality management). If (d) increases with one unit (moving to the next higher level), the likelihood of moving to the next level in the dependent decreases by a factor of 0.240.

Conclusion: Enterprises with the higher number of employees (medium and big ones) have a greater likelihood of having the full knowledge about the EU legislation; therefore, medium and big scale enterprises are more likely to have full knowledge about EU legislation regarding quality and safety.

e) Independent variable 'Export/annual turnover ratio (e)'; parameter estimates 0.241, this means a likelihood of higher dependent scores. To be specific, if the ratio of export/annual turnover in the company increases, there is an increase in the likelihood of scoring the lowest value in the dependent (1=Full knowledge about EU legislation). Therefore, if the ratio increases by one unit (to the next higher level), this increases the FBE chances of having full knowledge by factor of 1.272 (moving to the next lower categories). Nagelkerke coefficients vary from 0.063 to 0.223 representing weak effect sizes.

Conclusion: Companies with a higher Export/annual turnover ratio have considerably greater chances of having full knowledge of the EU legislation on quality and safety.

**Conclusions and Recommendations for the MoAFCP and FBE in Albania regarding knowing and implementing quality and safety standards**

- The MoAFCP must enforce informing activities regarding quality and safety to food industry enterprises.
- The MoAFCP must support the food industry with the necessary documentation regarding product quality and safety.
- The MoAFCP must enforce and carry out inspection activities regarding product quality and safety in the food industry in Albania.
- Food enterprises in Albania must invest in more computers for their institution and employees and ensure that each is connected to the internet as this represents a very important aspect of access to information.
- Large scale companies are more likely to have full knowledge about EU legislation regarding quality and safety (those who have high annual turnover and high numbers of employees).

For the third research question, five different dependent variables were considered that represent the different quality management aspects in the organization activities. In the beginning, the attitude of food and beverage enterprises in Albania towards investing in implementing widely recognized quality management systems was considered. To be more specific, the following dependent variable was selected, 'Willingness to invest in implementing ISO series'. By using the correlation matrix in SPSS, as many as 15 potential independent variables were used to determine the existence of any significant correlation amongst the dependent and independent variables. Although there were more than four variables that were correlated with the dependent variable, only four significant correlation coefficients were found. The following represent the independent variables that were selected:

(a) Percentage of the export in relation to the annual turnover of the company (coded 1 = Under 10%, 2 = 10% -30%, 3 = 31% - 50%, 4 = Over 50%, 5 = No export)

(b) Operational markets of your organization (nominal variable coded 1 = In local markets, 2 = In national markets, 3 = International markets, 4= All markets)

(c) Company's willingness to invest in training regarding quality management (1 =Yes, 2 = No, 3= Partially, 4 = No answer)

(d) Level of knowledge about ISO 9001:2000 (1= *Fully known*, 2= *Mostly known*, 3 = *Medium known* , 4 = *Poorly known*, 5 = *Not known*)

For the dependent variable, ‘Competition level perception’, a correlation matrix was applied and revealed five independent variables that were correlated significantly with the dependent variable. The independent variables were as follows:

(a) Is the benchmark method (comparison with the best) used in your organization’s activities? (1 = *Yes*, 2 = *No*, 3 = *Not relevant*)

(b) To what extent is your company applying client technical specifications? (1 = *Fully*, 2 = *Mostly*, 3 = *Medium*, 4 = *Poorly*, 5 = *Not at all*)

(c) Is your company focused on the delivery of the product? (1 = *Yes*, 2 = *No*, 3 = *No answer*)

(d) Has your company compiled inter-operational specifications? (1 = *Fully*, 2 = *Mostly*, 3 = *Medium*, 4 = *Poorly*, 5 = *Not at all*)

(e) How would you rate the collaboration between the person/marketing sector and the person/Research & Development sector in regards to production and quality control (1 = *Very good*, 2 = *Good*, 3 = *Low*, 4 = *Absent*, 5 = *No collaboration*)

**Table 5-4. Relationships between ‘Willingness to invest in ISO’ and four different QM variables (own calculation and data), Questionnaire 2009**

Willingness to invest in ISO 9001	Export/ annual turnover (%) (a)	Operational markets (b)	Willingness to invest in training (c)	Knowing ISO 9001 (d)
Correlation Coefficient	0.445**	-0.232*	0.229*	0.667**
Significance (2-tailed)	0.000	0.029	0.039	0.000
N	79	89	82	89
-2 Log-Likelihood	45.949	16.044	32.228	59.622
Chi-Square	16.931	6.114	7.003	58.066
Degrees of Freedom	3	2	2	4
Significance	0.001	0.047	0.030	0.000
Nagelkerke	0.204	0.090	0.086	0.504
Parameter Estimate	-1.840	0.936	-0.396	-2.147
Wald Statistics	14.884	4.765	0.185	8.526
Significance	0.000	0.029	0.617	0.004
<b>Exp (b) Odds ratio</b>	0.159	2.549	NA	0.011

a) Independent variable ‘Export/annual turnover (%) (a)’: Having a ration of export/annual turnover less than 10% is associated with the likelihood of scoring lower values in the dependent variable (Full or moderate willingness to invest on ISO standards). In other words, the low ratio by companies (less than 10%) regarding export/annual turnovers means that FBE are more likely to have full willingness to invest for apply ISO quality management systems. Companies that have higher ratio export/annual turnover (scoring to the levels higher than 1), seem to lack willingness to invest. This behavior can be explained with the fact that since they export, they fulfill a certain quality management standards for export (perhaps ISO or other standards) and do not need to invest in ISO.

b) Independent variable ‘Operational Markets (b)’: parameters estimate 0.936. Operating in the local markets is associated with higher levels in the dependent variable. This value represents a lack of willingness by FBE to invest in ISO. What is interesting to note is that as

more enterprises expand to other operational markets (going to the higher scoring levels), they will subsequently increase their willingness to invest in ISO by a factor of 2.549.

Conclusion: As FBE in Albania expand their operational markets outlook, it is more likely that they will have the willingness to invest in quality management standards. The logic behind this behavior is that if markets become more competitive, companies will have to improve their quality in order to survive in the market and be considered competitive.

c) and d) Independent variables (c) and (d) have parameters that estimate at -0.396 and -2.147, respectively. Both of these variables are associated with lower scores in the dependent, meaning higher willingness to invest in ISO. Although the parameter estimates for variable (c) is not significant ( $p > 0.05$ ), it can still be said that the companies that have the willingness to invest in training also have the willingness to invest in ISO.

For variable (d), it is interesting to note the strong impact effect (Nagelkerke 0.504) between the willingness to invest in ISO and the level of knowledge about ISO standards. Nagelkerke coefficients vary from 0.086 to 0.504 representing a weak to strong effect sizes.

Conclusion: Based on c) and d) results, it can be concluded that the more information and knowledge enterprises have about ISO standards, the more willing they will be to invest in these standards (i.e. training).

**Table 5-5. Relationships between ‘Competition level (perception)’ and five different QM variables from within the business environment (own calculation and data), Questionnaire 2009**

Competition Level	Benchmark method (a)	Applied client technical specifications (b)	Focus on delivery (c)	Compiling inter-operational specification (d)	Collaboration of R&D with prod. & QC (e)
Correlation Coefficient	0.258**	0.350**	0.341**	0.266**	0.345**
Significance (2-tailed)	0.009	0.000	0.000	0.008	0.000
N	102	99	106	99	100
-2 Log-Likelihood	23.373	30.437	14.800	28.577	24.865
Chi-Square	12.406	14.635	12.702	12.079	12.756
Degrees of Freedom	3	4	1	4	3
Significance	0.006	0.006	0.000	0.017	0.005
Nagelkerke	0.135	.0162	0.133	0.136	.0142
Parameter Estimate	-1.141	-1.750	1.498	-1.507	-1.839
Wald Statistics	6.688	9.521	11.477	4.909	4.425
Significance	0.010	0.002	0.001	0.027	0.035
<i>Exp (b) Odds ratio</i>	0.320	0.173	4.472	0.221	0.160

Independent variables (a), (b), (d), and (e) have parameter estimates at -1.141, -1.750, -1.507, -1.839, respectively, meaning that all variables are associated with a likelihood of lower values in the dependent variable. In other words, if enterprises apply the Benchmarking method in their activities, they are more likely to have the perception that the competition level in the Albanian food market is high. This also applies for the variable (b), if the enterprises apply client technical specifications, they are more likely to score in the lower levels of the dependent (meaning their attitude towards competition is high). For the variable (e), a higher level of collaboration between the R&D sector and the Quality and Control sector in the company results in scoring lower in the dependent variable. This means that the companies are more likely to have a high perception about the competition level in the sector.

The variable (c) has a parameter estimate of 1.498; this means that it is more likely to have a higher score in the dependent variable (low levels of perception regarding competition level in the market). Since this variable is a dichotomous variable, not focusing on product delivery (0 = No) is associated with lower levels of perception regarding the competition level (higher score levels). On the other hand, going one level higher in the independent variable (1= Yes, focusing on product delivery) increases the likelihood of scoring the next lower level in the dependent (higher attitude regarding competition by a factor of 4.472).

Nagelkerke coefficients vary from 0.133 to 0.162 representing effect sizes less than moderate.

### **Conclusions and Recommendations for food industry enterprises regarding the various aspects of quality and safety**

- FBE have to invest in training with respect to quality and subsequently achieve expertise and knowledge about ISO quality management systems.
- By expanding Albanian FBE operational markets, this will result in higher attitude towards the willingness to invest in ISO quality management systems.
- If FBE want to operate in national markets (high competition level), it is a good choice to conduct a benchmark analysis.
- If FBE want to operate in high competitive markets (national markets), they must focus on after sales services and on product delivery.
- In order to consider entering into competitive markets, FBE must also apply client technical specification, compile inter-operational specifications and have a good collaboration between sectors in their organization.

The three remaining dependent variables were chosen to investigate how the final objectives of an enterprise ('Annual turnover', 'Ratio export/annual turnover', and 'Compiled documentation regarding quality and safety') were affected by the different measures within the company with respect to quality management. All four dependent variables chosen also represented ordinal variables.

By using the SPSS correlation option, a correlation matrix was conducted to determine the possible associations between the dependent and independent variables different actions/measures aiming to improve quality management and safety of the products).

For the first dependent variable, 'Annual turnover', five independent variables that had a significant correlation coefficient were found, and a significant ordinal regression model was subsequently produced for all of them. The variables were as follows:

- (a) Do you apply quality management systems in your organization? (*1 = Yes, 2 = No, 3 = No answer*)
- (b) Extent of knowing the EU legislation (*1 = Fully known, 2 = Mostly known, 3 = Medium known, 4 = Poorly known, 5 = Not known*)
- (c) The qualification of your company lab staff is (*1 = High, 2 = Medium, 3 = Low, 4 = Not relevant, 5 = No answer*)
- (d) Are the client technical specification used in your production processes? (*1 = Fully, 2 = Mostly, 3 = Medium, 4 = Poorly, 5 = Not at all*)
- (e) How many computers are connected to the internet? (*1 = All, 2 = Mostly, 3 = Some, 4 = None of them*)

For the dependent variable, 'Ratio export/annual turnover', the same procedure as previously mentioned for 'Annual turnover' was used to determine five independent variables that were selected as follows:

- (a) Are your employees trained in the field of production technology? (*1 = Yes, 2 = No, 3 = No answer*)
- (b) Do you apply quality management systems in your organization? (*1 = Yes, 2 = No, 3 = No answer*)
- (c) Are your employees trained in the field of marketing? (*1 = Yes, 2 = No, 3 = No answer*)
- (d) Is your QMS certified? (*1 = Yes, 2 = No, 3 = No answer*)
- (e) Is your company focused on safety measures? (*1 = No, 2 = Yes, 3 = No answer*)

For the dependent variable 'Compiled documentation regarding quality and safety', the aim was to investigate and determine the variables inside and outside the organizations environment that could affect the dependent variable. The idea behind this approach was to determine what has to be improved in order for enterprises to compile the full documentation necessary regarding quality and safety.

Based on the correlation analysis, five independent variables were determined:

- (a) Is the benchmarking method used (comparison with the best) in your organization's activities? (*1 = Yes, 2 = No, 3 = Not relevant*)

## Analysis and Interpretation of the Results

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(b) How many computers are connected to the internet? (*1 = All, 2 = Mostly, 3 = Some, 4 = None of them*)

(c) How organized is the informing process regarding the food quality and safety legislation by the MoAFCP? (*1 = Very well, 2 = Well, 3 = Weak, 4 = Absent, 5 = No answer*)?

(d) Does the Company General Regulation allocate the competencies and tasks that are related to food quality and safety in the marketing sector? (*1 = Fully, 2 = Mostly, 3 = Medium, 4 = Poorly, 5 = Not known*)

(e) Does the Company General Regulation allocate the competencies and tasks that are related to food quality and safety in the R&D sector? (*1 = Fully, 2 = Mostly, 3 = Medium, 4 = Poorly, 5 = Not known*)

**Table 5-6. Relationships between ‘Annual turnover’ and the five different QM variables (own calculation and data), Questionnaire 2009**

Annual turnover (2007, million ALL)	Applying Management Standards (a)	EU Legislation (b)	Qualifications of lab. Staff (c)	Applied client technical specifications (d)	Connection to internet (e)
Correlation Coefficient	-0.243*	-0.418**	-0.369**	-0.345**	-0.456**
Significance (2-tailed)	0.012	0.000	0.000	0.000	0.000
N	106	106	96	99	104
-2 Log-Likelihood	20.041	26.333	24.619	28.977	31.682
Chi-Square	6.451	23.889	14.839	15.343	36.308
Degrees of Freedom	1	4	3	4	4
Significance	0.011	0.000	0.002	0.004	0.000
Nagelkerke	0.71	0.243	0.172	0.176	0.354
Parameter Estimate	1.198	3.166	1.947	1.990	2.531
Wald Statistics	6.919	8.289	14.007	9.315	11.799
Significance	0.009	0.004	0.000	0.002	0.001
<b>Exp (b) Odds ratio</b>	3.298	23.704	7.006	7.314	12.562

All independent variables previously mentioned (a-e) have positive parameter estimates, which means that they are more likely to score at higher levels in the dependent variable (higher level of annual turnover). On the other hand, if they do not apply management standards (moving to the next level in independent), this results in an increase in the chance of scoring to the next lower level in the dependent by a factor 3.298.

Moreover, if enterprises do not have the full knowledge regarding EU legislation on quality and safety, the chances that they can score the lowest level in the dependent variable increases considerably by a factor of 23.704.

The same logic applies for variable (c) and (d), if the enterprises do not have the required qualifications for their lab staff and do not apply to the full extent client technical

specification in their production process, the chances that they score a lower level in the dependent variable increases by a factor of 7.006 and 7.314, respectively.

Furthermore, independent variable (d) shows that if enterprises do not have all computers connected to the internet, the chances that they score a lower level in the dependent variable increase considerably by a factor of 12.562. Nagelkerke coefficients 0.172 – 0.71 indicate moderate to strong effect size of dependency between dependent and independent variables.

**Table 5-7. Relationships between ‘export/annual turnover’ and the five QM variables (own calculation and data), Questionnaire 2009**

Export/annual turnover ratio	Technology of production (a)	Applying Management standards (b)	Marketing (c)	QMS Certification (d)	Focus on safety measures (e)
Correlation Coefficient	0.350**	0.304**	0.228*	0.296**	-0.300**
Significance (2-tailed)	0.000	0.002	0.025	0.003	0.003
N	97	97	97	96	97
-2 Log-Likelihood	20.490	17.881	22.385	18.221	15.919
Chi-Square	12.153	9.739	5.012	9.121	10.351
Degrees of Freedom	1	1	1	1	1
Significance	0.000	0.002	0.025	0.03	0.001
Nagelkerke	0.136	0.110	0.058	0.104	0.117
Parameter Estimate	-1.424	-1.670	-1.065	-1.773	2.548
Wald Statistics	11.695	7.658	4.336	6.679	5.441
Significance	0.001	0.006	0.037	0.010	0.020
<b>Exp (b) Odds ratio</b>	0.240	0.188	0.345	0.170	12.778

The first four independent variables (a), (b), (c) and (d) have negative parameter estimates at -1.424, -1.670, -1.065 and -1.965, respectively; this means that they have a likelihood of having lower scores in the dependent variable (lower ratio Export/annual turnover). Therefore, it can be said that despite the fact that FBE may focus training on technology of production, in marketing, applying quality management systems and have the QMS certified, the Albanian FBE are more likely to have a low level export/annual turnover ratio.

Variable (e) has a parameter estimate of 2.548, which means that it is associated with higher scores in the dependent variable, or in other words, companies that are focusing on safety measures for their products are more likely to have a higher ratio of export/annual turnover. Nagelkerke coefficients vary from 0.058 to 0.136; therefore, the impact effect size for variables varies from weak to medium.

**Table 5-8. Relationships between ‘compiled regulation with regard to quality and safety’ and the five different QM variables (own calculation and data), Questionnaire 2009**

Compiled regulation with regard to quality and safety	Benchmark Approach (a)	Connection to internet (b)	MoAFCP informing process (c)	Task regarding Q&S (marketing Sector) (d)	Tasks regarding Q&S (R&D) (e)
Correlation Coefficient	0.268**	0.399**	0.302**	0.608**	0.587**
Significance (2-tailed)	0.009	0.000	0.003	0.000	0.000
N	94	96	97	94	92
-2 Log-Likelihood	32.011	42.764	37.336	37.516	38.706
Chi-Square	9.110	20.937	11.596	49.040	41.550
Degrees of Freedom	3	4	3	4	4
Significance	0.028	0.000	0.009	0.000	0.000
Nagelkerke	0.104	0.222	0.128	0.466	0.421
Parameter Estimate	-1.252	-1.927	-1.219	-3.704	-3.340
Wald Statistics	6.801	9.721	4.068	7.792	11.727
Significance	0.009	0.002	0.044	0.005	0.001
<i>Exp (b) Odds ratio</i>	0.285	0.145	0.275	0.024	0.035

All independent variables (a), (b), (c), (d) and (e) have negative parameter estimates (-1.252, -1.927, -1.219, -3.704 and -3.035, respectively), which subsequently means a likelihood of scoring the highest levels for the dependent variable. If the enterprises apply the Benchmark approach (a), have all computers connected to the internet (b), have well established tasks regarding quality management in the marketing sector (d) and have well established tasks regarding quality and safety in the research and development sector (e), they are more likely to have compiled regulation with regard to quality and safety. Also, if the MoAFCP were to

execute the informing process to the full extent, than the enterprises are more likely to compile the regulations regarding quality and safety. When considering the independent variables, these variables reduce significantly the chances that the enterprises will compile the regulations regarding quality and safety by a factor of (a): 0.285, (b) 0.145, (c) 0.275, (d) 0.024, (e) 0.035, respectively. Nagelkerke coefficients vary from 0.104 to 0.466 representing a weak to strong effect sizes.

### **Recommendations and conclusions for FBE**

- FBE in Albania must apply quality management standards and have a full knowledge of quality legislation.
- FBE must invest and put more effort into information technology (i.e. computers and access to internet), must have qualified lab staff (education status) and must apply to the full extent client technical specification in order to increase their annual turnover.
- Generally, companies have a low export/annual turnover ratio, despite their efforts in executing different aspects of quality management.
- FBE must improve their efforts in safety measures to increase their chances of export.
- FBE must establish a clear picture regarding the product quality and safety tasks in each department, and should carry out the benchmark analysis approach to ensure a good and accepted platform for documentations regarding quality and safety.
- The informing process by the MoAFCP must be done at the required level.

## **6. Discussions, Conclusions and Recommendations**

In this chapter, the author will discuss and compare the key findings in this study with results from similar studies and other literature sources. The Discussion section is structured according to the research question stated at the beginning of the chapter titled, 'Analysis and Interpretation of the Results'. The subsequent conclusions section outlines the main findings of this study, elaborates on all established hypotheses, and how this study answered each of them. In the Recommendations section, respective recommendations are made for actors that participate or play a role in the food and beverage market in Albania.

### **6.1 Discussions**

Limited studies in Albania have focused on the field of quality and safety of food and beverage products from the scientific and governmental (governmental institutions who operate in the field of food quality and safety and consumer protection bodies) perspective. As such, this study represents one of the first studies in the field of food quality and safety in the Albanian food industry.

Based on literature review and analysis of other sources regarding the first research question, "*What is the level of information that the FBE (Food and Beverage Enterprises) have regarding legislation (Albanian and international) about food/beverage products?*", similar results were found.

To illustrate, in 2005, Southeast European Enterprise Development (SEED) investigated the food and beverage sector in Albania by taking a sample of 90 enterprises representative of all subsectors within this industry. The main objectives of the study were to a) make evident and evaluate the current situation of the food and beverage processing enterprises in the field of product quality and safety; and b) establish a data basis (approximately 90 enterprises that operate in the food and beverages industry) for performing general evaluations and interventions that can be undertaken from SEED partners such as the Export Promotion Agency, Albanian Institute for Quality (SEED 2005:22). The results from this study have shown that over 80% of the surveyed enterprises were familiar with Albanian legislation (legislative framework on food quality and safety). The results from the SEED (2005) study were found to be very similar to those acquired in this specific study (80% of enterprises surveyed have almost full or full knowledge about Albanian legislation on food quality and safety). Regarding European legislation on quality and safety, the SEED study found that

nearly 60% of enterprises surveyed had a satisfactory level of knowledge (SEED 2005:22), while this study found that approximately 75% of enterprises have the necessary knowledge about EU legislation. The numbers in this study are more optimistic as enterprises from this study are more aware of new developments in the field of quality and safety. This increase in awareness since the 2005 study by SEED may be due to the raising competition in the food markets and new potentials for export in regional and European markets. Applying obligatory regulations for EU legislation in the food and beverage industry and increasing information access and sharing can have a desired impact on keeping FBE aware of new developments in the field of quality and safety. The main source of information, in terms of food quality and safety, in the food and beverage industry appears to be the MoAFCP; to illustrate, both the SEED study (2005) and this study (2009) have results from enterprises to support this statement%.

Regarding the research question, *“What is the relation of food and beverage enterprises with markets and clients for issues related to quality and safety?”*

In Kapaj's (2004) study, “Decision-making on quality management in the meat processing industry in Albania”, he investigates the situation in meat processing enterprises in Albania with special emphasis on quality standards and quality improvement towards consumer preferences. The study utilizes a descriptive statistical analysis on data gathered from 30 enterprises (out of 54 meat processing enterprises in Albania). Kapaj (2004) found that in general, enterprises in Albania are not using scientific studies (studies from universities, etc.) for gathering the information about consumer preferences with regard to quality. To be specific, based on his results, 71% of the enterprises stated that contact with clients (company surveys) is the main source for gathering the information regarding consumer demand and needs, while for this study (Kapaj 2009) 69% of enterprises also used this approach of contact with clients to gather the same type of information. According to FBE feedback, by asking consumers directly about their demands and needs, enterprises believe that they are avoiding information distortion which may be more present in other secondary approaches of information gathering. On the other hand, despite the source of information gathering, all enterprises orient their production towards consumer preferences. All entrepreneurs in the meat processing sector are aware of the advantages of including consumers' demands and needs in the production process (Kapaj 2004:85). Although Kapaj's study covers only the meat processing industry in Albania, the results seem to be compatible with those found in this study in terms of information trading and usage.

In this study (2009), a small number of FBE in Albania (10%) sell their products through distributors (usually medium and relatively large scale companies), most of them (49%) have a combined trading scheme through distributors and retail outlets. By trading through these forms of schemes, FBE can have a relatively close communication with consumers in terms of quality and safety of their products. This type of information is important to compare to businesses in other sectors of the market in order to better understand consumers' reaction to food and beverage products as consumer preferences and the sense of responsiveness on food and beverage products may change often and are mostly considered for the short term.

For the research question, *“What is the level of production technology in the food and beverage industry in relation to product quality and safety?”*

According to SEED 2005, 81% of FBE stated that they have prepared the technical specifications of the products and that a considerable number of these enterprises (47%) have also drafted the technical inter-operational specifications (SEED, 2005:30). In this study, 65% of the enterprises have drafted the technical specification and less than 41% of them have drafted the inter-operational specifications. Also, based on the SEED study results, most FBE use their standards for compilation of product and inter-operational specification (around 70%). In this study (2009), 91% of FBE surveyed use their own standards, a % higher than that found from SEED 2005. The use of other standards like Codex Alimentarius accounts for 33% of FBE (SEED 2005) while for this study, it accounts for 26%. Regarding the level of technology in response to quality and safety requirements, it has been found that 93% of the FBE that were part of the survey believe that the technology they use in the manufacturing process meets the product quality and safety requirements (SEED 2005: 32), while for this study, 92% of the enterprises believe that the level of technology also meets the quality and safety requirements. Considering this number, where almost all FBE find very good compliance between production technology and product quality and safety requirements, it seems that there are nonrealistic answers regarding this question. The enterprises perception about quality requirements is embodied in the existing level of technology; as such, FBE link the level of technology with existing quality of the products. In the evaluation of the above figures regarding production technology in relation to product quality and safety, real capabilities of the enterprises must be considered in order to make appropriate self-evaluations without being objective about how things are in reality. Also, this perception of the enterprises about level of technology may have a negative impact on future enterprises

plans for technology renovation in response to consumer's requirements regarding products quality and safety.

For the research question, *“To what extent is the quality and safety control of the products in the food and beverage industry realized?”*

The situation of the quality and safety control in the food and beverage industry in Albania, referring to hygienic-sanitation conditions in the enterprises, has remained quite steady (around 90% of them fulfill hygienic-sanitation requirements) for the last five years. According to SEED 2005, more than 80% of the enterprises surveyed believe that they have met the hygienic-sanitation conditions in the context of GMP (SEED 2005:34). Also, the SEED study contains supportive results regarding the percentage of enterprises who measure all characteristics of the products and the percentage of enterprises that do these measurements in their own or other labs. The situation in 2004 (SEED 2005) and in 2008 (for this study) appears to be steady, (approximately half of the enterprises have established their test laboratories), indicating no improvement.

For the research question, *“What is the level of product and system certification in the food and beverage industry?”*

Based on the Euro chambers Report (2004) titled, “Competitiveness of Western Balkan Companies”, 1,052 companies from Serbia and Montenegro, 424 companies from Croatia, 298 companies from Bosnia and Herzegovina, 250 companies from Albania and 142 companies from the FYR of Macedonia, among others were surveyed. From the report, results revealed that 19% of Albanian enterprises surveyed have undergone the internationally recognized quality management system certification (Euro Chambers 2004). Based on Euro chambers study, the situation with quality certification differs from one country to another and is more optimistic in other Western Balkan Countries compared to Albania. For instance, in Serbia and Montenegro, 22% of companies have internationally recognized quality certifications 32% in Bosnia, 34% in Croatia % and 53% in the FYR of Macedonia (Euro Chambers 2004).

The status of FBE lies behind the national and internationally recognized quality certification. Quality certification for the products counts for 14% of FBE; whereas quality management system certification, ISO 9001 / HACCP, is obtained by 6% of FBE (SEED

2005:38). In this study, 18% of enterprises have their management system certified. Compared to the SEED study completed in 2005, the situation regarding management system certification appears to be optimistic with an increase of 12% over five years.

According to the SEED (2005) study, it was determined that there was a need for product certification by 90% of FBE and a need for certification of quality and safety management systems by 70% of FBE. In addition, the readiness to invest in certification of products is expressed by 25% of FBE and certification of a management system by 35% of enterprises surveyed (SEED 2005). Comparing the findings from Kapaj (2004), it was found that in the meat industry in Albania, no meat processing enterprises (in the sample) apply internationally recognized quality management standards (ISO, HACCP and GMP). Kapaj (2004) found that 22% of enterprises apply management standards established by the organization and that 77% of meat processing enterprises apply management standards established by public institutions or governmental agencies (Kapaj 2004). FBE that participated in the Euro chamber study appreciated the importance of quality accreditation; to be specific, only 7% of companies said that they did not have any intention of obtaining some sort of quality standards accreditation. An impressive number of companies (27%) stated that they already have internationally recognized quality certification. However, a lot of companies (47%) stated that they do not yet have any certification but do have plans to acquire one. These numbers are based on the 2 161 Western Balkan Countries companies who participated in the 2004 Euro Chambers survey. (Euro Chambers 2004).

The aforementioned results from the Euro Chambers and SEED studies support the findings of this study within Albania where almost all FBE surveyed have their product certified. Meanwhile in this study, 75% of FBE expressed the necessity of implementation and certification of a quality management system. The willingness to invest in product certification in this study is expressed by approximately one fifth of the enterprises. Also, the willingness to invest in ISO standards is expressed by 65% of the enterprises and for HACCP by 45% of the enterprises. In this study, results in terms of product and system certification are more optimistic as after more than four years, awareness seems to have increased for product quality and business quality management. According to the Euro chambers study, in Albania, up to 21% of companies do not plan to obtain quality standards accreditation, other countries scored much higher in this respect (Euro Chamber 2004).

## **6.2 Conclusions and recommendations**

**Hypothesis A:** The national food and beverage safety legislation is well known within the Albanian processing enterprises. Furthermore, a low number of these organizations comply with voluntary regulations and standards.

Based on the results from this study, 80% of FBE surveyed stated that they operate in good or very good accordance with Albanian legislation on quality and safety. Concerning is the fact that 20% of the enterprises that operate in the food and beverage sector have very unsatisfied levels of knowledge regarding the domestic legislation or do not know anything about it. The MoAFCP is considered the main institution that provides support with relevant documentation to the food and beverage industry. In order for FBE to get the necessary documents regarding Albanian legislation, they should first and foremost have access to the information. Despite the different possible sources where the FBE may acquire these documents, the majority of FBE consider the state as the main provider. Within the MoAFCP, there are a number of agencies whose special task is to supply the FBE with information in various ways such as information seminars, workshops, leaflets and printed materials as they relate to product quality and safety.

Due to new circumstances developing in the food and beverage market and after noticing the slightly positive trends in terms of implementation and certification of product and management systems by FBE, it is the enterprises responsibility to acquire information and deal with problems of product quality and safety. Providing information about QMS, organizing workshops and seminars promoting the advantages of QMS certifications and also the new possibilities for export, may all have a positive impact in the implementation and certification of QMS. This needed responsibility applies for enterprises operating in the domestic markets, but in particular for those that export and those who intend to export. Based on the question, “Are you informed on the main European Directives concerning the hygiene and safety of food and beverage products?”, 75% of the enterprises surveyed had given a positive answer. This means that the trend in the free market (by reducing trade barriers and taxes, and the Free Trade Agreements with some Balkan countries) and also the perspective of Albania to join the EU market (more competitive markets in the food sector) have a positive impact in terms of increasing awareness for food and beverage products’ quality and safety.

As an important source of information, internet is not widely used in the food and beverage enterprises in Albania. Around 55% of FBE do not have internet at all, whereas 31% within

this group use computers but do not have internet connection. Euro chambers (2004) study shows a low usage regarding e-mail use in all companies included in the study of 2 161 companies: 500 companies (approximately 25%) have only one e-mail account for the whole company, 340 companies (18%) have e-mail addresses for key employees only, while 80 companies (around 4%) have an e-mail address for each employee and again 80 companies (around 4%) do not use e-mail at all in their work (Euro chambers 2004).

Considering each country in this regard, the Euro chambers report shows that in Albania only In Albania only 1% of companies have an e-mail address for each employee and only 14% have e-mail addresses for key employees. Therefore, one of the main aspects to highlight of the current situation in the food industry within Albania is in regards to its e-mail usage. The comparable figures in Croatia, for instance, are 17% and 51% respectively, in FYR of Macedonia 9% and 40%, in Serbia and Montenegro 7% and 32%.

FBE in Albania are mainly small scale, operate in local markets and have a small number of employees. Informing this group of enterprises about the positive effects of using computers and internet is a task that must be fulfilled by the institutions in charge (i.e. the MoAFCP, Commerce and Industry Chamber, etc.). This can be done through workshops, seminars or leaflets explaining the benefits of getting the new legislation and regulations regarding quality and safety domestically and internationally.

**Hypothesis B:** Food and beverage processing companies in Albania are aware of importance of applying quality management systems for the safety of their products, as well as for certifying their products and systems in order to be competitive in the market.

Competition in the food and beverage industry has just started, but at low intensity. Although 75% of FBE do not apply quality management systems, they admit the necessity of implementing and acquiring certification of these systems. According to the enterprises view, increasing competition in the food and beverage sector appears to be the main reason for QMS implementation. They also believe that it is particularly the quality of the products that make the difference for success or failure in the increasingly competitive food and beverage markets. On the other hand, half of the enterprises believe that they fulfill the requirements of quality management systems (ISO and HACCP). It has also been found in this study that a positive shift in attitudes is occurring in that more FBE are willing to invest for system implementation and certification. The main factors preventing enterprises from implementing QMS appears to be the lack of financial means and lack of knowledge. The main incentive

factors behind QMS implementation appears to also be the increasing competition in the food market due to FTA (Free Trade Agreements), potential future export markets (European markets), increasing market share, customers loyalty, image, etc. According to Ribou (2005), this study of the food industry in Spain found company culture to be the main reason for the implementation of a quality system, followed by the company size and high cost (Ribou *et al.* 2005).

**Hypothesis C:** A Small number of food and beverage enterprises in Albania have applied the quality management systems to assure quality and safety of the products.

At present, there may be multiple reasons as to why FBE have chosen not to get certified; to illustrate, the relatively young age and small size of the enterprises, difficulties due to lack of financial resources, lack of trained human capacities and high competitive markets. As such, the situation regarding certification may be best described as relatively lagging behind in Albania (only 19% of food and beverage enterprises has applied quality management systems), not only with reference to the EU countries, but compared to the Balkan region countries as well (SEED 2005).

The problem of certification in the field of quality and safety in the food industry, in particular, is better known and has been treated more intensively by the actors concerned in recent years. In this study, increasing awareness towards these systems is found, raising competition in the food markets and also adoption of domestic legislation on food in compliance with EU legislation since Albania aims to join the EU. Since the many achievements in the recent years with regard to quality management implementation and certification, it can be concluded that the developments in this direction have a rising positive trend.

**Hypothesis D:** Information in terms of quality and safety, operational markets, employee's qualification and collaboration between departments in organization, all play a very important role in the attitude of FBE to implement and certify quality management systems.

If the information regarding product quality and safety regarding QMS would be supplied in an intensive way from the public agencies and would be acquired at a satisfactory level from FBE, then the chances of enterprises implementing quality QMS to improve the overall quality performance of their organization would increase significantly. On the other hand, operational markets play an important role in the willingness of FBE to improve product

quality and implement QMS. As FBE aim to expand in the market (operate in bigger and large markets), their willingness to invest on ISO quality management systems must also increase. FBE must consider investing in employee's qualification, in terms of quality and safety and in production technology as they both appear to have a significant positive effect on the behavior of FBE towards improving quality in organization.

### **Recommendations**

Many actors are interested in and benefit from the development of FBE in issues related to product quality and safety. They are interested in increasing the number of food and beverage product certifications and quality management system certifications achieving an end result that provides better quality and more safety confidence of the food products. Based on the results of this study, recommendations are addressed based on the main actors' interest and involvement in this development trend. The recommendations are categorized for each actor in the food and beverage markets and are given to enterprises in the food and beverage industry, to consumers and to public institutions dealing with problems of food quality and safety.

#### *Recommendations to Food and Beverage Enterprises*

This section aims at promoting a better and more complete approach for FBE to meet the challenge of certifications in the field of quality and safety of products; in particular, consolidating the quality control system and Good Work Practices as a basis for the system of quality and safety management.

- Increasing competitiveness in the food market and aiming to enter the European market must motivate all the managers of FBE to raise the level of basic knowledge related to international legislation on quality.
- All FBE must set up or improve their organizational structure, paying special attention to the links related to quality and safety of products, within sectors and between sectors.
- All FBE must undertake the necessary steps for drafting and improving the technical and inter-operational specifications both in its content and form. Drafting and improvement of technical specifications must be made by relying strongly not only on national standards, but also on the foreign standards, especially in the international standards of Codex Alimentarius.

- All FBE must build up a plan for identifying and addressing the problems of non-conformity and subsequently take the appropriate measures to address those problems. Also, the specification of Good Working Practices regarding hygiene-sanitation conditions must be applied by all FBE.
- Establishing labs in the organization or at taking the appropriate measurements for food and beverage products is very important. FBE must draft the documentation for the quality control department. FBE are not able (lack of financial means and human capacities) to establish their own lab must find other ways to keep under control all characteristics of their products.
- FBE must consider an upgrade to new production technology in order for the technology to meet the requirements of improved technical and inter-operational specification. Also, FBE have to have good collaborations within and between sectors to be successful in high competitive markets.
- The issues regarding trainings of employees must be more seriously addressed by the majority of FBE. Trainings must cover all the areas of business activities from the production technology quality and safety to the marketing and management of the products. A special focus must be paid to the trainings related to quality and safety issues for personnel employed in the quality control department.
- FBE should find alternative sources of information for the most up to date and current developments in the field of quality and safety. FBE should consider and utilize the internet in their organization as an alternative and reliable source of information as relying only on support from governmental institutions may not be as dependable for certain situations and aspects.
- All FBE should invest in trainings run by experts for their employees with respect to product quality and safety and management systems; on the other hand, FBE should also consider hiring experts in the field to avoid having to pay for too much training for staff. FBE should also improve their effort on safety measures to increase the chances for export and ability to be competitive in the market.
- Utilizing the Benchmark analysis approach could be a very good choice for FBE because this may increase their chances to enter into more competitive markets (from local to national to regional). On the other hand, if FBE want to enter into high competitive markets, they have to focus more on after sales services and on product delivery.

- Food and beverage enterprises that aim to enter the European markets should implement and certify internationally recognized quality management systems. The product quality and safety must be kept in high surveillance and must be continuously monitored.

### *Recommendations to consumers of food and beverage enterprises*

- All actors interested in the further development of the quality and safety of Albanian products must support as much as possible the expansion and strengthening of the Albanian Consumer Associations, in order to accomplish the mission they have been assigned.
- Besides the intensification of the campaigns for raising awareness of consumers concerning their respective rights, the Consumer Associations must find appropriate forms and ways to boost the information level of consumers, especially at the technical level of information.
- Associations that protect consumers rights must aim to cooperate more with the institutions and organizations interested in food quality and safety so that the pressure of the consumers will create more emphasis resulting in a more “aggressive” approach which may be more effective in terms of getting FBE to be certified and more concerned of product quality and safety.

### *Recommendations to public institutions (governmental institutions)*

- The MoAFCP must revise the policy regarding food and beverage quality and safety. Activities of this institution in terms of informing the food industry about the latest management systems and regulations on quality and safety should be demanded by enterprises. The MoAFCP should consider developing a separate body or sector that can carry out the task of consultancy and certification.
- Developing a legal framework for the quality and safety of food products should be the focus of the MoAFCP. The new Albanian Food Law should also provide regulations for a sound labeling and advertising of food products, which should help to improve consumer information levels. The MoAFCP must take the initiative to make HACCP a method of obligatory application as soon as possible.

- The MoAFCP should strengthen the assistance and improve the work methods in its inspection activities on food and beverage enterprises. Also, integrated action in collaboration with the inspection department of the municipality can have a better impact on quality and safety improvement of food products.
- Other public institutions like the Chambers of Commerce and Industry must progress with the same speed as FBE industry do, to provide better and more enhanced support to them in activities related to this development.
- Much more assistance and service should be provided to FBE by other public institutions (i.e., the General Directorate of Standardization, the General Directorate of Metrology and Calibration, the Directorate of Accreditation, the Institute of Hygiene and Epidemiology, the Food Research Institute, etc.) directly linked to food quality and safety.
- Large-scale and more food quality oriented activities should be organized and implemented by the Non-Profit Organizations that include small and medium sized enterprises in the food and beverage sector. Better connections and coordination of the work between all actors that participate in the food markets and in particular with the governmental institutions or agencies operating in food domain should be established by the Non-Profit-Organizations.

## 7. Summary

It is apparent that the consumers, for many reasons, do not have the ability to control directly the product they are purchasing. It is the FBE who have the ability to control and manage the quality and the safety of the products keeping in mind the customers' expectations of a product in terms of quality and safety. The mechanism that realizes this demand today is certification, a process that every product and system of quality and safety management in an enterprise should undergo. The management of quality and safety is concretized in the framework of a special system: as an international system for quality and safety, under the care of the special international organizations; as a national system, under the care of the respective ministries and institutions of a country; and as a system of quality and safety of a certain enterprise, established and maintained by the directorate of this enterprise.

The attention in this analysis for this study is more focused on the management of products quality and safety issues at the level of the FBE. In this study, the elaboration of these issues is done in the logical sequence of the consumer, the standards and legislation, the quality and the safety of the products in the enterprise, the certification according to the standards and in the end, some general data regarding food and beverage enterprises.

The changes that have occurred in the Albanian market regarding food products and beverages, especially the increase of the quantity/demand and variety, have resulted in the development of a new standard within the food and beverage industry as well as made it apparent the importance of the FBE relations with the markets and amongst other FBE as well. . Among the main features of this food and beverage paradigm is that consumers set higher expectations, especially concerning qualitative requirements, resulting in fierce competition between FBE. Such a situation imposes changes and transformations within FBE, not only progressive changes but in some aspects even revolutionary changes.

The last 15 years markets a transition period within the industry as increased number of imports have transformed the internal market of food products and beverages into "an international market". In this market exists a continuous competition between foreign products and national products. The export of food products and beverages, although in low quantities and very spontaneous, has started to make the Albanian FBE aware of the competition with western enterprises in the foreign market "ring", which today is considered the global market.

The agreements that the Albanian Government has signed with the WTO and EU, such as the Agreement on the Technical Barriers of Commerce with the WTO and the Stabilization-Association Agreement with the EU, to name a few, treat also the technical problems related directly to the ‘pillars’ of the ‘Temple of quality’: standardization, metrology, accreditation and certification. It is on these ‘pillars’ that the restructured and reformed Albanian enterprise should be set, so that it can overcome the obstacles that are present in the global market.

Albanian FBE, regardless of their current status in the markets, are making attempts and are being prepared to face the inevitable challenges that lie ahead regarding the multi-plan development that includes the economic, technical, human, managerial aspects and more importantly the Albanian mentality and culture.

Even for the Albanian enterprises, the purpose of their establishment, development, and existence is and always will be for the profit. The significance of profit and the need for it to constantly be increasing and improving is closely related to the investment made from the enterprise, but with different attitudes. To be specific, in the earlier stages of enterprise development, short term investment is often implemented supported by the slogan, ‘I am investing today so I gain the profit still today’; whereas in the later stages of development where there exists the competitive market enterprises follow the slogan, ‘I am investing today so that I gain the profit tomorrow or the day after tomorrow’. This slogan makes the enterprise think and work foremost for the long-term investment, which is an investment that provides a more sustainable profit and strategic approach for survival in the market. Profit is the indicator of long-term investments. It is one of the most important indicators through which FBE can be evaluated regarding the economic-technical-human-managerial level of the enterprises. In order to establish and to put into play the certification system, some requirements by the consumer side are needed (i.e., legislation, ministries, different organizations), etc., but also from the enterprises side. Regardless, the level that is achieved it is important to define the indicator, through which is measured the quality and safety level in an enterprise, in an industrial sector, and even in a state; today, this indicator is the certification indicator.

As stated above, besides the issues related to quality for food and beverage products, there are also the safety-related problems to consider. The latter are of particular importance and are related with the so-called “consumer protection” rights, as they represent the potential risks or harm to consumers health in using and consuming the products produced by the FBE in the processing stages.

The legislation on food and beverage products quality and safety, as part of the general legislation of the Republic of Albania, is based on the respective legislation of the European Union. Intensification for this legislation to be completed is encouraged and supported mainly by the international agreement, where a special section covers the Stabilization Association Agreement. This Agreement, among others, instructs and controls the adaptation of the European Directives towards that of the European one regarding the products quality and safety. In addition, it aims to harmonize the legal acts and relevant by-acts (technical regulations, decisions, orders, and guidelines).

Therefore, in order to explore the possibilities and the potential trends of the development in the field of product quality and safety, a detailed analysis of the current situation of the FBE in Albania was completed. To be more specific, the study included the assimilation of data and information gathered from face to face interviews investigating the FBE in Albania regarding product quality and safety. Albanian FBE comprised the basis of the selected sample. A sample of 112 enterprises was chosen to participate in the face to face interview, of which 106 enterprises actually completed the questionnaire. As such, the FBE sample from this study was considered to be representative of this sector of the processing industry in Albania. The respondents of the FBE were mainly managers, owners or high level personnel of the selected food and beverage processing enterprises. A descriptive statistical analysis was used to elaborate the situation within the food and beverage industry in Albania. A model of ordinal logistic regression was used to quantify the effects of the different management factors on different quality management aspects.

According to the enterprises who participated in the questionnaire, informing activities from the Ministry of Agriculture Food and Consumer Protection (MoAFCP) were weak or absent; only the inspection activity was done well. In addition, more than half of the enterprises surveyed had allocated the competencies regarding quality and safety in their own respective departments. Next, it was determined that Albanian FBE operate mostly in domestic markets (local and national) with some exceptions. Moreover, 95 percent of enterprises stated that they communicate with their customers regarding product quality and safety, representing the main source of information to FBE in this regard. Information from scientific studies is rarely used for decision making in terms of quality.

The enterprises standards are widely used for compiling technical specifications for their products, while international standards are used only in some enterprises. Further determined from the study results was that almost all FBE believe that their production technology

responds to the product quality and safety requirements. All FBE stated full compliance of their production activities with the requirements of Good Management Practices. In addition, more than half of the FBE lab facilities were non-existent (missing) and half of the enterprises did not even measure any characteristics of their products. Next, there seems to be no standard for the qualification of employees in terms of quality and safety but enterprises did express their willingness to invest in such trainings for their employees. Furthermore, in the majority of FBE cases, materials related to product quality and safety were provided from governmental agencies. Next, 75% of FBE have their products labeled and certified, whereas 21 of FBE also express the willingness to invest in label improvement or relabeling. Nearly 75% of FBE do not apply international quality management standards (ISO, HACCP, TQM), but they understand and support the need for applying and certifying such systems.

Based on the regression analysis, it was determined that information and activities from the MoAFCP, as they relate to product quality and safety in particular, have a great impact on enterprises willingness to invest in QMS. Furthermore, FBE training of employees, focusing on selling and on product delivery and application of client technical specification, appear to all be prerequisites to entering the competitive markets. On the other hand, application of management standards and certification, qualifications of employees, increased level of information on quality standards and updated production technology, all have a significant impact on enterprises annual turnover and export/annual turnover ratio.

It is recommended that the MoAFCP and all related governmental agencies, such as the Veterinary Institute, Commerce and Industry Chamber and the General Directorate of Standardization must put more effort into information sharing/awareness and communication activities in terms of food and beverage quality and safety as well as on quality management standards. More importantly, food and beverage enterprises should address the issues of alternative sources of information, improving their organizational structure, upgrading production technology, investing in trainings, investing in label improvement and product certification and application and certification of QMS, as prerequisites for increasing their overall business performance.

## Zusammenfassung

Es ist offensichtlich, dass Konsumenten vor dem Kauf von Produkten nicht die Möglichkeiten haben die Qualität und die Sicherheit der von den Firmen hergestellten Produkte direkt zu kontrollieren. Trotzdem fragen sie Produkte nach bei denen sie hauptsächlich auf die Sicherheit oder wenigstens auf die ausreichende Verlässlichkeit der Qualität achten. Der Mechanismus der diese Nachfrage regelt ist die Zertifizierung, ein Prozess der jedes Produkt und jedes Qualitäts- und Sicherheitsmanagementsystem mit einbezieht. Das Qualitäts- und Sicherheitsmanagement wird im Rahmen eines speziellen Systems konkretisiert: Als internationales Qualitäts- und Sicherheitssystem unter der Aufsicht von speziellen internationalen Organisationen, als nationales System unter der Aufsicht der jeweiligen Ministerien und Institutionen eines Landes und als Qualitäts- und Sicherheitssystem eines Unternehmens, welches von der Geschäftsleitung eingeführt und aufrechterhalten wird.

Das Augenmerk dieser Analyse liegt auf Problemen im Qualitäts- und Sicherheitsmanagement von Produkten auf Betriebsebene, im Bereich der Nahrungsmittel- und Getränkeproduzenten (Food and Beverage Enterprises: FBE). Die Ausarbeitung dieser Probleme erfolgt anhand folgender Punkte: Standards und Gesetzgebung, Qualität und Sicherheit von Produkten in Unternehmen, Zertifizierung entsprechend der Standards und schließlich allgemeine Daten zu Nahrungsmittel- und Getränkeproduzenten.

Die Wandel im albanischen Nahrungsmittel- und Getränkemarkt, speziell die steigende Vielfalt und Größe, haben neue Inhalte und Formen nicht nur innerhalb der FBE, sondern auch für die Beziehungen zwischen diesen Unternehmen hervorgebracht. Die Hauptcharakteristika dieser Situation sind: höhere Erwartungen der Konsumenten, gesteigerte qualitative Anforderungen und harte Konkurrenz zwischen den Unternehmen. Solch eine Situation zwingt die FBE zu Wandel und Transformationen. In einigen Aspekten können diese Wandel über den Entwicklungswandel hinaus revolutionär sein.

Die große Anzahl von Importen in den letzten 15 Jahren der Übergangsperiode hat den internen Nahrungsmittel- und Getränkemarkt zu einem „Internationalen Markt“ transformiert; in diesem Markt konkurrieren die ausländischen und einheimischen Produkte. Der Export von Nahrungsmitteln und Getränken, obwohl er nur in kleinen Mengen und spontan geschieht, hat den FBE Möglichkeiten der Konkurrenz mit ausländischen Firmen im nicht-einheimischen „Kreis“ aufgezeigt, welcher heutzutage als Weltmarkt gesehen wird.

Die Vereinbarungen, welche die albanische Regierung mit der WTO und der EU unterschrieben hat, wie z.B. das „Agreement on the Technical Barriers of Commerce“ mit der WTO und das „Stabilization-Association Agreement“ mit der EU, beinhalten auch die

technischen Probleme. Beide hängen direkt mit den „Säulen“ des „Tempels der Qualität (temple of quality)“ zusammen: Standardisierung, Messwesen, Akkreditierung und Zertifizierung. Auf diesen „Säulen“ sollten die re-strukturierten und reformierten albanischen Unternehmen sitzen, um die Hindernisse im globalen Handel bezwingen zu können.

Die FBE, unabhängig auf welcher Ebene, machen Versuche und sind vorbereitet den unausweichlichen Herausforderungen der multi-plan Entwicklung unter ökonomischen, technischen, humanen, betriebswirtschaftlichen Aspekten und anhand von Kultur und Mentalität zu begegnen.

Auch für albanische Unternehmen ist und wird der Grund für die Gründung und Entwicklung von Unternehmen der Profit sein. Der Profit und das notwendige Wachstum sind eng mit den Investitionen der Unternehmen verbunden, aber die Einstellungen hierzu unterscheiden sich: In niedrigeren Entwicklungsstufen sind kurzzeitige Investitionen charakteristisch, welche der Devise folgen: „ich investiere heute und verdiene heute“. In den höheren Entwicklungsstufen, in denen ein wettbewerbsfähiger Markt existiert, wird dahingegen eher die Devise „ich investiere heute und verdiene Morgen oder Übermorgen“ befolgt. In diesen Unternehmen investieren und denken die Unternehmen langfristiger, um eine nachhaltige und sichere Marktposition zu gewährleisten, sowie um strategischen Profit zu erwirtschaften. Langzeitinvestitionen sind ein wichtiger Indikator, um den ökonomischen-technischen-humanen-betriebswirtschaftlichen Level eines Unternehmens zu bewerten. Um ein Zertifizierungssystem zu etablieren, gibt es Anforderungen seitens der Konsumenten, seitens der politischen Entscheidungsträger, welche die Regulierer der Märkte sind (Legislative, Ministerien und unterschiedliche Organisationen), aber auch seitens der Unternehmen. Unabhängig vom erreichten Level ist es wichtig den Indikator zu definieren, anhand dessen die Qualität und Sicherheit in einem Unternehmen, einem industriellen Sektor oder sogar in einem Staat bewertet werden soll. Heutzutage ist dieser Indikator die Zertifizierung.

Wie oben erwähnt haben Nahrungsmittel- und Getränkeprodukte neben Problemen mit der Qualität auch Probleme mit der Sicherheit. Diese Probleme sind von besonderer Bedeutung und beziehen sich auf den „Verbraucherschutz“, da sie mit potentiellen Risiken oder der Gefährdung der Gesundheit der Verbraucher durch den Konsum von den verarbeiteten Produkten einhergehen.

Die Gesetzgebung für die Qualität und Sicherheit von Nahrungsmitteln und Getränken, als Bestandteil der allgemeinen Gesetzgebung der Republik von Albanien, basiert auf der entsprechenden Gesetzgebung der Europäischen Union. Die Intensivierung der Erfüllung dieser Gesetzgebung wird gefördert und unterstützt durch internationale Vereinbarungen. Ein

besonderer Teil behandelt das „Stabilization-Association Agreement“, welches unter anderem festlegt, dass die europäischen Richtlinien zur Annäherung der Infrastruktur der Produktqualität und -sicherheit adaptiert werden und dass die relevanten Rechtsakte harmonisiert werden (technische Regulierungen, Entscheidungen, Anweisungen und Leitlinien).

Um die Möglichkeiten und potentiellen Trends in der Entwicklung im Feld der Qualität und Sicherheit von Produkten zu untersuchen, wird die gegenwärtige Situation der FBE anhand von Daten einer Erhebung der FBE analysiert. Die FBE werden dabei als typisches Beispiel des Sektors der verarbeitenden Industrie angesehen. Die Untersuchungsmethode der persönlichen Befragung wurde angewandt, um die FBE in Albanien zu untersuchen. 112 Unternehmen wurden für die Befragung ausgewählt, von denen 106 geantwortet haben. Die Befragten waren hauptsächlich Manager, Besitzer oder leitende Angestellte der ausgewählten Nahrungsmittel- und Getränkeunternehmen. Eine beschreibende statistische Analyse untersucht die Situation der albanischen Nahrungsmittel- und Getränkeindustrie und ein ordinales logistisches Regressionsmodell quantifiziert die Einflüsse von Managementfaktoren auf unterschiedliche Aspekte des Qualitätsmanagements.

Laut den Unternehmen sind informative Aktivitäten des Ministeriums für Landwirtschaft, Nahrung und Verbraucherschutz (MoAFCP) schwach oder werden nicht durchgeführt. Ausschließlich die Inspektionsaktivitäten werden gut durchgeführt. Mehr als die Hälfte der untersuchten Unternehmen haben die Befähigungen hinsichtlich Qualität und Sicherheit den jeweiligen Abteilungen übertragen. Mit nur wenigen Ausnahmen operieren die FBE hauptsächlich auf den einheimischen Märkten (lokal und national). 95% der Unternehmen kommunizieren mit ihren Kunden hinsichtlich der Qualität und Sicherheit der Produkte. Diese Form der Informationsgenerierung scheint die Hauptquelle für Informationen in diesem Zusammenhang zu sein. Information aus wissenschaftlichen Studien werden selten zur Entscheidungsfindung im Bereich der Qualität herangezogen.

Die Standards der Unternehmen sind weit verbreitet um die technischen Spezifikationen der Produkte zusammenzutragen, dagegen werden internationale Standards nur in wenigen Unternehmen angewandt. Fast alle FBE sind der Auffassung, dass ihre Produktionstechnologien auf die Anforderungen der Qualität und Sicherheit der Produkte eingehen. Alle Unternehmen geben an, dass Ihre Produktionsaktivitäten mit den Anforderungen der „Good Management Practices“ übereinstimmen. In mehr als der Hälfte der FBE gibt es keine Laboratorien und die Hälfte der Unternehmen untersucht gar keine Charakteristika. Qualifikationen der Mitarbeiter hinsichtlich Qualität und Sicherheit fehlen,

aber Unternehmen haben ihre Bereitschaft zu Investitionen in Fortbildungen signalisiert. In den meisten Fällen stammt Material bezüglich der Qualität und Sicherheit der Produkte von den Regierungsbehörden. 75% der FBE haben Produkte welche durch Labels gekennzeichnet und zertifiziert sind, wobei 21% ihre Bereitschaft zu Investitionen für die Verbesserung von Labels und Neukennzeichnungen signalisiert haben. Fast  $\frac{3}{4}$  der FBE wenden keine internationalen Qualitätsmanagementstandards an (ISO, HACCP, TQM), aber sie erkennen die Notwendigkeit der Anwendung der Zertifizierungssysteme.

Die Regressionsanalyse hat gezeigt, dass allgemeine Informationen und Aktivitäten des MoAFCP hinsichtlich Qualität und Sicherheit einen großen Einfluss auf die Bereitschaft der Unternehmen in Qualitätsmanagementsysteme zu investieren haben. Es scheint, dass das Training der Mitarbeiter, die Konzentration auf Kundendienst und Produktlieferung und die Anwendung von technischen Spezifikationen eine Voraussetzung sind, um in wettbewerbsbetonte Märkte einzusteigen. Andererseits haben die Anwendung von Managementstandards und Zertifizierung, die Qualifikation der Mitarbeiter und der erhöhte Grad an Informationen hinsichtlich Qualität und Sicherheit, sowie aktuelle Produktionstechnologien einen großen Einfluss auf den jährlichen Unternehmensumsatz und auf das Verhältnis von Export zu jährlichem Umsatz.

Es wird empfohlen, dass das MoAFCP und alle zugehörigen Behörden wie das Veterinärinstitut, die Industrie- und Handelskammer, die Generaldirektion für Standardisierung, und weitere, mehr Anstrengungen in Informations- und Kommunikationsaktivitäten hinsichtlich der Qualität und Sicherheit von Nahrungsmitteln und Getränken, aber auch in Qualitätsmanagementstandards investieren müssen. Die FBE müssen ernsthaft Themen wie alternative Informationsquellen, Verbesserung der Organisationsstruktur, Ausbau der Produktionstechnologien, Investitionen in Trainings, Investitionen in die Verbesserung von Labels und Produktzertifizierung und die Anwendung und Zertifizierung von Qualitätsmanagementsystemen angehen, da dies Voraussetzungen für verbesserte Unternehmensleistungen sind.

## References

- Agresti, Alan. 2002. *Categorical data analysis*. Wiley series in probability and statistics. 2nd ed. New York: Wiley-Interscience.
- . 1996. *An introduction to categorical data analysis*. Wiley series in probability and statistics. New York, NY [u.a.]: Wiley.
- Ahlman, H., (1989). *Quality Strategy for Survival and Increased Prosperity*. The Quality Meeting at Linköping University.
- American Society for Quality Control (ASQC), ANSI/ASQC A1-1978. *Definitions, Symbols, Formulas and Tables for Control Charts*.
- Babbie, Earl R. 2007. *The practice of social research*. 11th ed. Belmont, CA: Wadsworth Publishing.
- Backhaus, Klaus. 2006. *Multivariate analysemethoden eine anwendungsorientierte einföhrung; mit 6 tabellen*. Springer-lehrbuch. 11., überarb. Aufl. ed. Berlin Heidelberg [u.a.]: Springer.
- Bergman, B. and Klefsjö, B., (1994). *Quality, from costumers needs to costumers satisfaction*. McCraw – Hill, New York.
- Bernard, H. Russell. 2000. *Social research methods : Qualitative and quantitative approaches*. Thousand Oaks, Calif.: Sage Publications.
- Bernard, H. Russell, and Gery Wayne Ryan. 2010. *Analyzing qualitative data : Systematic approaches*. Thousand Oaks, Calif.: Corwin.
- Civici, A., (2003), The Situation and Competitiveness Level of the Agro-food Sector in Albania. Tirana, Albania.
- Codex Alimentation Commission, a joint FAO/WTO Food Standards Programme, (1997), *Codex Alimentation, General Requirements (food hygiene) Supplement*, volume 1b, 2<sup>nd</sup> ed, Rome, Italy.
- Crosby, P.B., (1979). *Quality is Free*. McCraw – Hill, New York.

- Deming, W.E., (1993). *The New Economics for Industry, Government, Education*. MIT Centre for Advanced Engineering Study, Cambridge MA.
- EFQM. European benchmarking code of conduct. 2009 [cited 12/14 2009]. Available from <http://www.qualityscotland.co.uk/assets/Newsletter-2009-07/European%20Benchmarking%20smaller.pdf>.
- Euro Chambers (2004). ALBANIA; *Survey on Albanian enterprises; Competition of Western Balkan Companies*.
- Euro Chambers (2004).SERBIA AND MONTENEGRO; *Survey on Serbia and Montenegro enterprises; Competition of Western Balkan Companies*.
- Euro Chambers (2004).BOSNIA AND HERCEGOVINA; *Survey on Bosnia and Hrcegovina enterprises; Competition of Western Balkan Companies*.
- Euro Chambers (2004). CROATIA; *Survey on Croatian enterprises; Competition of Western Balkan Companies*.
- Euro Chambers (2004). FYR-MACEDONIA ; *Survey on FYR - Macedonia enterprises; Competition of Western Balkan Companies*.
- Evans, J.R. and Lindsay, W.M., (1996). *The Management and Control of Quality*. Evans, J.R. and Lindsay, W.M. (eds), west publishing company, St Paul.
- Field, Andy P. 2009a. *Discovering statistics using SPSS : (and sex, drugs and rock 'n' roll)*. 3rd ed. Los Angeles: SAGE Publications.
- . 2009b. *Discovering statistics using SPSS : (and sex, drugs and rock 'n' roll)*. 3rd ed. Los Angeles: SAGE Publications.
- Furubotn, Eirik G., and Rudolf Richter. 2005. *Institutions and economic theory : The contribution of the new institutional economics*. Neue institutionenökonomik. 2. ed. ed. Ann Arbor: Univ. of Michigan Press.
- Garvin, D. (1984). *What does product quality really mean?* Sloan Management Review, Vol.26, pp.25-45

## References

---

- Giere, R. N. 1989. Scientific rationality as instrumental rationality. *Studies in History and Philosophy of Science* 20, (3): 377-84.
- Goodman, L. A. 1971. The analysis of multidimensional contingency tables: Stepwise procedures and direct estimation methods for building models for multiple classifications. *Technometrics* 13, (1): 33-61.
- Hair, Joseph F. 2006. *Multivariate data analysis*. 6th ed. Upper Saddle River, N.J.: Pearson Prentice Hall.
- Henry, Gary T. 1990. *Practical sampling*. Applied social research methods series. 1. print. ed. Vol. 21. Newbury Park [u.a.]: Sage.
- Hill, R. Carter, William E. Griffiths, and Guay C. Lim. 2008. *Principles of econometrics*. 3rd ed. Hoboken, NJ: Wiley.
- Hoogland, J.P., Jellema, A and Jorgen, W.F.M., (1998). *Quality Assurance in Innovation of Food Production Systems*. Wageningen Pers, Wageningen pp.139-158.
- Hosmer, David W., and Stanley Lemeshow. 2000a. *Applied logistic regression*. Wiley series in probability and statistics. 2nd ed. New York: Wiley.
- . 2000b. *Applied logistic regression*. Wiley series in probability and statistics. 2nd ed. New York: Wiley.
- INSTAT, (Institute of Statistics) 2009. *Statistical Yearbook 2004*. Tirana, Albania.
- Institute of Food Science and Technology (IFST). 1998. *Food and Drink-Good Manufacturing Practice: A Guide to its Responsible Management*. 4th edition. IFST publication.
- \_\_\_\_\_ (1991),. *Food and Drink-Good Manufacturing Practice: A Guide to its Responsible Management*. 1<sup>st</sup> edition. IFST publication
- International Monetary Found. *2010 World Economic Outlook*. Washington, December 2010.
- International Standardization Organization (ISO), (1998). *Quality Management Systems-Guidelines (9004; 2000)*. Document ISO/TC 176/SC 2N/415.

## References

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- International Standardization Organization (ISO), (1998a). *Quality Management Systems- Concepts and Vocabulary* ISO 9000:2000, ISO/TC 176/SC1/N185.
- International Standardization Organization (ISO), (1994). *Quality Systems-Model for Quality Assurance in Design, Development, Production, Installation and Servicing* ISO: 9001, Quality Management and Quality Systems Elements ISO. 9004.
- Juran, J.M., (1990). *Juran on Leadership for Quality*. The Free Press, New York.
- Kapaj, I. (2004). Assessing the quality and safety of the meat processing industry in Albania. Master theses. Stuttgart/ Germany.
- Krzanowski, W. J. 2000. *Principles of multivariate analysis : A user's perspective*. Oxford statistical science series. Rev ed. Vol. 22. Oxford Oxfordshire ; New York: Oxford University Press.
- . 1998. *An introduction to statistical modelling*. Arnold texts in statistics. London ; New York: Arnold.
- Luning, L.A., Marcelis, W.J. and Jorgen, W.M.F., (2002). *Food Quality Management: a Techno Managerial Approach*. Wageningen Pers, Wageningen, Netherlands
- Maxim, Paul S. 1999. *Quantitative research methods in the social sciences*. New York: Oxford University Press.
- McCullagh, P. 1980. Regression models for ordinal data. *Journal of the Royal Statistical Society. Series B (Methodological)* 42, (2): 109-42.
- McCullagh, P., and J. A. Nelder. Generalized linear models, 1989. *Boca Raton: Chapman & Hall*.
- Ministry of Agriculture Food and Consumer Protection. 2010, *.Statistical yearbook .* MoAFCP, Tirana/Albania.
- Ministry of Agriculture Food and Consumer Protection. 2009, *. Database for registered food and beverage enterprises in Albania*. MoAFCP, Tirana/Albania.

## References

---

- \_\_\_\_\_. 2008, . *Database for registered food and beverage enterprises in Albania*. MoAFCP, Tirana/Albania.
- \_\_\_\_\_. 2006, . *Database for registered food and beverage enterprises in Albania*. MoAFCP, Tirana/Albania.
- \_\_\_\_\_. 2005, . *Database for registered food and beverage enterprises in Albania*. MoAFCP, Tirana/Albania.
- Ministry of Agriculture Food and Consumer Protection. 2009. *Sector Strategy of Agriculture and Food (SSAF) 2007 – 2013*. Tirana/Albania.
- Morath, Clemens. 2008. *Umsetzung und potenzielle des ganzheitlichen qualitätsmanagements in unternehmen des ernährungsgewerbes*. 1. Aufl., Cuvillier.
- NNI Dutch Normalization Institute, (1999). *Information Workshops in Changes in the ISO 9000 norms; How to assure Quality after 2000*. NNI-Education.
- Norušis, M. J. 2008. *SPSS 16.0 advanced statistical procedures companion*. Upper Saddle River, NJ: Prentice Hall.
- Noori, H. and Radford, R., (1995), “Production and Operation Management: Total Quality Repansiveness”, McCraw – Hill, New York.
- Rubio, T. Arias, R. *Study of the Main Motivations and Discouraging Factors for the Implementation of ISO 9000 Standards in Spanish Agribusiness Sector*. Journal of International Food & Agribusiness Marketing, Vol. 17(2) 2005.
- Robson, Colin. 1993. *Real world research a resource for social scientists and practitioner-researchers*. Oxford, UK [u.a.]: Blackwell.
- Rosenblatt, Judah I. 2002. *Basic statistical methods and models for the sciences*. Boca Raton, Fla.: Chapman & Hall/CRC.
- Rousseau, E. 2003. *Survey research methodology*. SAEM Annual Meeting, June 1(University of Arizona): 5-10.

## References

---

- Schiefer, G. 2002. *Quality management in agriculture and food: Management principles, system requirements, and development directions*. 2. Aufl. ed. Vol. 94,2. Bonn: ILB.
- SEED - Southeast European Enterprise Development (2005). *Survey on Albanian enterprises of food and beverages processing*.
- Shoemaker, Pamela J., James W. Tankard, and Dominic L. Lasorsa. 2004. *How to build social science theories*. Thousand Oaks, CA: Sage.
- Stanly, S.E., (1998). The challenges and Opportunities of ISO 9000 Registration: Your Costumers are Calling. CIM Bulletin, 1018, 215-220.
- Sustainable Animal Production (2001). The Importance of Quality Assurance and Food Safety in Modern Food ProductionSystems.
- <http://www.agriculture.de/acms1/conf6/ws3qual.htm> (Accessed: 13/9/2010).
- US Food and Drug Administartion (FDA) 1994. *Food Importation*: Documents numner 92N-0457. 10903 New Hampshire Ave. Silver Spring, MD 20993.
- Van der Berg, M.G.. and Delsing, B.M.A., (1999). *Quality of Food. 2nd edition*, Kluwer, Deventer; The Netherlands, pp 360.
- Walker, S. H., and D. B. Duncan. 1967. Estimation of the probability of an event as a function of several independent variables. *Biometrika* 54, (1): 167-79.

## **Annexes**

### QUESTIONNAIRE

## **Assessing quality and safety of food & beverage products in the Albanian processing enterprises**

Hohenheim University  
Stuttgart/Germany

**I. CONTACT POINTS**

1. Name of the company: .....

2. Address of the company:

2.1 Street, Number .....

2.2 City .....

2.3 Tel / Fax .....

2.4 E-mail .....

**SECTION A ASSESSMENTS OF THE QUALITY AND SAFETY OF THE PRODUCTS****I. LEGISLATION OF THE QUALITY AND SAFETY OF THE FOOD AND BEVERAGE PRODUCTS**

**1. Is the European legislation about food/ beverage products quality and safety known (directives of EU 93/43/CEE, 96/3/CE, 2001/95/CE) as it relates to the field of hygiene of food beverage products and the general safety of the product?**

1.1 Fully known  1.2 Mostly  1.3-Medium  1.4 Poorly known  1.5- Not known **2. Albanian legislation about the quality and safety of food/ beverage products**

*1- Fully known , 2 - Mostly known, 3 - Medium known, 4 - Poorly known, 5 - Not known at all*

Nr.	Question	1	2	3	4	5
2.1	Is the "Law on Standardization", No. 8464, dated 11.03.1999, known?					
2.2	Is the "Law on the Measurement Units and the Control of the Measurement Units (Metrology)", No. 8996, dated 30.01.2003 known?					
2.3	Is the "Law on Assessing the Conformity", No. 8464, dated 03.07.2003 known?					
2.4	Is the "Law on Protecting the Consumer" No. 9135, dated 11.09.2003 known?					
2.5	Is the "Law On Food", No. 7941 and dated 31.05.1995, known?					
2.6	Does the Order of the Minister for Food and Agriculture (No.103, dated 20.03.1998) discuss "The procedures of issuing the permits for producing new products"?					

2.7	Does the Order of the Minister for food and Agriculture (No. 139, dated 08.04.1998) discuss “The Technical-technological and professional permits for producing food products”?				
2.8	Does the Decision-Guideline of the Ministry of Agriculture and Food (No. 224, dated 24.05.2002; No. 295, dated 15.10.2002) include “the Guarantee Deadlines of the food products”?				
2.9	Does the Decision-Regulation of the Ministry of Agriculture and Food (No. 604, dated 17.11.2000) include the “Labeling the food products”?				
2.10	Are you aware of the Law “On the Sanitation State Inspectorate” (No. 7643, dated 02.12.1992)?				

**3. The provision of the documentation of the legislation regarding the quality and the safety of the food/ beverage products is achieved through?**

3.1 Ministry of Agriculture and Food  3.2 Commerce and Industry Chamber

3.3 Other institution

**4. The Support of the Ministry of Agriculture Food and Consumer Protection in relation with the legislation**

*1 – Absent; 2 – Weak; 3 – Well; 4 – Very well*

Nr.	Question	1	2	3	4
4.1	How would you classify the organization of the information sharing process developed by the MoAFCP regarding the food quality and safety legislation?				
4.2	How would you classify the organization of the MoAFCP’s supply of documentation regarding the food quality and safety legislation from MoAFCP?				
4.3	How would you classify the clarity of the seminars held by the MoAFCP regarding food quality and safety legislation?				
4.4	How would you classify the inspection/observation of food quality and safety conducted by the Directorate for Quality and Inspection at the MoAFCP?				
4.5	How would you classify the inspection of the food quality and safety conducted by the Inspection Department in the Municipality?				

**5. Is there any support and help from the Commerce and Industry Chamber regarding the company food quality and safety?**

5.1 Yes  5.2 No  5.3 Not relevant

If YES, what kind of?

.....

.....

**6. Level of information/network/computerization in the company and the connection to the internet**

6.1 Number of computers that are in operation: .....

**6.2 Connection to the internet:** 6.1 All  6.2 Mostly  6.3 Some  6.4 None of them

**II. ORGANIZATION STRUCTURE AND ITS BASIC DOCUMENTATION**

*1- Fully known, 2- Mostly known, 3-Medium known, 4- Poorly known, 5- Not known at all*

Nr.	Question	1	2	3	4	5
1	Has the company officially made public its organizational structure through its organigram?					
2	<b>Are the persons below part of the organigram, and in direct dependency from the directors of the company:</b>					
2.1	Is the person (part-time or full time) or Research & Development department part of your organization?					
2.2	To what extent is the person (part-time or full time) or the Sector for controlling the food quality and safety contribute to your organization?					
3	<b>Is the General Regulation of the Company compiled?</b>					
4	<b>Does the Company's General Regulations distinguish its capabilities and outline the tasks that are related to the food quality and safety within following departments:</b>					
4.1	<b>quality and safety within following departments:</b>					
4.2	Management					
4.3	Research & Development department					
4.4	Production department					
	Marketing department					

III. RELATION WITH THE MARKET - CLIENTS

**1. The Company operates:** 1.1 In the local market  1.2 In the national market   
1.3 Both

**2. The company trades through:** 2.1 Distributors  2.2 Retail Outlets  2.3 Both

**3. The Company prefers to trade in:** 3.1 The retail outlets that belong to the others   
3.2 Retail outlets of the company

**4. The Level of Competition that the company products “feel” in the market:**

4.1 Very high  4.2 High  4.3 Low  4.4 Absent

**5. The Participation of the company in fairs and expositions:**

5.1 Local ones in the year: 20003- 2004  2005- 2006  Last two years

5.2 National ones in the years: 20003- 2004  2005- 2006  Last two years

5.3 International ones in the years: 2003-2004  2005-2006  Last two years

**6. The positive effect for the food quality and safety coming from the participation in fairs and expositions:**

6.1 Very good  6.2 Good  6.3 Low  6.4 Absent

**7. Do you have any experience of communicating with the clients for the food quality and safety of the company?** 7.1 Yes  7.2 No  7.3 No answer

**8. How do you gather the information on what clients/consumers demand to your products with regard to quality (multiple choices possible)?**

8.1 Carry out surveys  8.2 Decision-making by participation  8.3 University studies

8.4 Statistical institution  8.4 Nothing  8.5 Others .....

9. In which of these three elements of the commercial quality is the company more focused on?

9.1 Product  9.2 Product price  9.3 Time of product deliver  9.4 Other safety

**10. In which extent do you think that the person/marketing sector must know the problems of product quality and safety of the company?**

10.1 Very good       10.2 Good       10.3 Low       10.4 Absent

**11. Collaboration between the person/marketing sector and the person/Research Development Sector, Production, Quality Control:**

11.1 Very good       11.2 Good       11.3 Low       11.4 Absent

**IV. TECHNICAL SPECIFICATIONS – STANDARDS OF THE FOOD BEVERAGE PRODUCTS**

**1. The Standard of the product is considered:** Obligatory       Voluntary

**2. Technical Specifications in the company:**

*1- Fully, 2- Mostly, 3-Medium, 4- Poorly, 5- Not at all*

Nr.	Question	1	2	3	4	5
2.1	Has the company compiled its technical specification for their products?					
2.2	Has the company compiled the inter-operational specifications for their products?					

**3. Sources for the compilation of the product technical specification**

*1- Fully, 2- Mostly, 3-Medium, 4- Poorly, 5- Not at all*

Nr.	Question	1	2	3	4	5
3.1	Is the Law on Standardization applied?					
3.2	Is Codex Alimentarius used?					
3.3	Is the client technical specification used?					
3.4	Does it exist the information on the Catalogue for the Albanian Standards?					
3.5	Is the Albanian standard used?					
3.6	Is the standard of the Association used?					
3.7	Is the foreign Standard used?					

- 4. Is the Benchmarking method used (comparison with the best) during the compilation of the technical specification?** 1.1 Yes  1.2 No   
1.3 Not relevant

#### V. TECHNOLOGY OF THE PRODUCT

- 1. Does the level of the existing technological level of production respond to the requirements for quality and safety requested by the legislation and the market?**

1.1 Yes  1.2 No  1.3 No opinion

- 2. Has the company planned the renovation of the production technology?**

2.1 Yes  2.2 No  2.3 No opinion

- 3. The presence of the production technology person in the company:**

3.1 There is no one  3.2 There is a medium qualified one  3.3 There is a highly qualified one

- 4. The qualification of the production employees:**

*1- Fully, 2- Mostly, 3-Medium, 4- Poorly, 5- Not at all*

Nr.	Question	1	2	3	4	5
4.1	Does the qualification of the employees respond to the level of existing technology?					
4.2	Has the company planned internal trainings, organized and lead by its highly qualified staff, in the field of the production technique and technology?					

- 5. Has the documentation for the production technology been compiled**

(the written procedures (instructions) of the products production, the registries of the raw material and of production, etc)?

5.1 Yes  5.2 Partially  5.3 No

#### VI. GOOD MANAGEMENT PRACTICES (GMP)

- 1. Does the proper climate of responsibility exist in the company related to the health of consumers that consume its products?** 1.1 Yes  1.2 Somehow  1.3 No

- 2. Respecting all the respective hygienic-sanitation requirements:**

*1- Fully, 2- Mostly, 3-Medium, 4- Poorly, 5- Not at all*

Nr.	Question	1	2	3	4	5
2.1	Is the <b>construction of the building</b> for producing/storing the products appropriate in relation to the organization's hygienic-sanitation requirements?					
2.2	Do these requirements include if a garbage disposal provided, proper allocation of garbage containers determined and the drainage system <b>around the building</b> and their cleaning clearly designated and scheduled?					
2.3	Do measures exist to avoid leaking points? To be specific, is there regular monitoring of the pipes system and discharge of the water from the <b>terrace/roof</b> ?					
2.4	Are the <b>doors and the windows</b> of the production/packaging sectors in proper condition? To be specific, are they closed (subsequent proper isolation provided) with an automatic closing mechanism that has nets or plastic belts?					
2.5	Are the <b>ceilings, walls and floors</b> of the production/packaging sectors made of materials that can be easily washed?					
2.6	Does the organization provide an environment that is without the presence of <b>insects, rodents</b> , etc. in the production/packaging sectors?					
2.7	Is there a <b>proper ventilation system</b> that exists in the production/packaging sectors?					
2.8	Is there a <b>proper lightening system</b> that exists in the production/packaging sectors?					
2.9	Are there <b>proper infestation</b> prevention/control vessels at the entrance of the production/packaging sectors?					
2.10	Do the workers have appropriate toilets (undamaged and clean)?					
2.11	Do the production/packaging sectors have sufficient <b>sinks</b> (undamaged, clean, with hot and cold water) and drying papers?					
2.12	Does the production/packaging staff have the appropriate <b>clothing</b> that is clean and appropriate (apron, hood, etc.)?					
2.13	Are there sufficient and appropriate <b>dressing rooms</b> for the employees of the production/packaging sectors?					

2.14	Do the employees of the production/packaging sectors respect the hygienic-sanitation rules?				
2.15	Are the <b>cleaning, washing and the disinfections</b> of the machineries and equipment of the production/packaging sectors properly done?				
2.16	Are the hygienic-sanitation conditions fulfilled while accessing the <b>raw material, packaging material, ingredients, disinfestations elements</b> , etc. in the stores?				
2.17	Is the <b>quality of the water and the air</b> in contact with the product controlled?				
2.18	Is the <b>documentation</b> for the monitoring and controlling of the product's hygienic-sanitation conditions documented for the production/packaging process?				
2.19	Are there fully respected hygienic-sanitation conditions in the <b>transport vehicles</b> used for distributing the products?				
2.20	Are there fully respected hygienic-sanitation conditions in the <b>outlets</b> where the products of the company are being sold?				

**4. Has the company created the coding system in the produced food product, which enables the application of the so-called “product pursuit”?**

4.1 Yes       4.2 No       4.3 No answer

**5. Has the company created the signal plan, to keep under control the products that are not in conformity?** 5.1 Yes       5.2 No       5.3 No answer

## VII. QUALITY AND SAFETY CONTROL OF THE PRODUCTS

**1. Does the company have any measurements lab?** 1.1 Yes       1.2 No       1.3 No answer

**2. Measuring the features of the products in the company lab:**

*1- None; 2- Some; 3 -All*

Nr.	Question	1	2	3
2.1	How many organo-leptic features are measured?			
2.2	How many physical-chemical features are measured?			
2.3	How many micro-biological features are measured?			

**3. Do you measure products' features, which you can not measure in your lab, in other labs outside the company?**

3.1 Yes       3.2 No       3.3 No answer

**4. Does the company conduct the calibration of the measuring tools of the lab?**

4.1 Completely       4.2 Partially       4.3 No       4.4 No answer

**5. The qualification of the company lab staff:**

5.1 High       5.2 Medium       5.3 Low

**6. Does your company have any investment plan to improve the technical materials and the equipment of the lab?**    6.1 Yes     6.2 Partially     6.3 No     6.4 No answer

**7. Number of employees involved:** In production: ..... In the quality control .....

**8. Which is the quality control stage upon which the company has been mostly focused on?**

8.1 In the control at the Entrance (of the raw material, surpluses, etc.)

8.1 In the control of the Production Process (of the operational product)

8.1 In the Acceptance Control (of the final product)

8.1 Others

.....

**9. Does the company address the negative effect of the nonconformity to quality and safety of the products being produced?**

9.1 Yes     9.2 No     9.3 Sometimes

## VIII. PERSONNEL

**1. Are the employees that work in the crucial points of the production line/sector motivated with high salaries?**    1.1 Yes     1.2 Partially     1.3 No     1.4 No answer

**2. How many of the employees of the production/product storage are equipped with the health certificate?**

2.1 All       2.2 Partially       2.3 None       2.4 No answer

Note: 1-Absent; 2- Low; 3- Normal; 4-High

Nr.	Question	1	2	3	4
3	<b>If you have recruited high qualified people that have been graduated during these last five years, how do you assess their preparation in the field of quality and safety of food products/drinks?</b>				
4	<b>How is the level of the positive cooperation climate among the personnel:</b>				
4.1					
4.2	Within the sectors, Among the sectors?				

**5. Is the company willing to invest for trainings in the field of the product quality and safety**    5.1 Yes     5.2 No     5.3 No answer

#### IX. RELATIONS WITH THE MAIN INSTITUTIONS

**1. Are any materials or services used, in terms of quality and safety, from the Hygiene and Epidemiology Institute?**

1.1 Yes     1.2 Partially     1.3 No     1.4 Not relevant

**2. Are there any materials or services used, in terms of quality and safety, from the Veterinary Institute?**

2.1 Yes     2.2 Partially     2.3 No     2.4 Not relevant

**3. Are there any materials or services used, in terms of quality and safety, from the General Standardization Directorate?**

3.1 Yes     3.2 Partially     3.3 No     3.4 Not relevant

**4. Are there any materials or services used, in terms of quality and safety, from the General Directorate of Metrology and Calibration?**    4.1 Yes     4.2 Partially

4.3 No     4.4 Not relevant

COMMENTS: Which are the strengths and the weaknesses of the company regarding the issues of SECTION A

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.....

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#### SECTION B ASSESSMENTS OF THE LABELING/PATENTING OF THE PRODUCTS

I. PATENTING/LABELING OF THE PRODUCT

- 1. Does the company feel the need for patenting/labeling the product? Yes  No
- 2. Is the product of the company patented/labelled? Yes  No  Year.....
- 3. Is the company willing to invest for the patenting/labeling/relabeling of the product?**  
3.1 Yes  3.2 Somehow  3.3 No
- 4. Which standard do you consider in product certification: 4.1 Albanian  4.2 Foreign
- 5. The positive effects of product certification:**  
5.1 High  5.2 Low  5.3 No effects

What kind of effects (If 5.1 or 5.2)?

.....  
.....

- 6. Duration of performing product certification:** ..... Months
- 7. Total expenses of product certification:** ..... mil./leke or ..... Euro

II. BODIES/INSTITUTIONS OF PRODUCT CERTIFICATION

**1. Data on institution of product certification:**

1.1 Nationality ..... Name .....

**2. The lab where is carried out the analysis for expertise and control of certification and its status:**

2.1 Nationality ..... Name .....

2.2 Recognized  2.3 Unrecognized

**3. Which is the amount of money you paid for certification:** .....mil. Leke or .....Euro

COMMENTS FOR SECTION B

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.....  
.....

*SECTION C* APPRAISAL OF QUALITY MANAGEMENT AND QUALITY ASSURANCE SYSTEMS

**I.SYSTEM AND COMPANY STATUS COGNITION**

**1. Do you already apply ISO 9001, HACCP or IFC or BRS?** 1.1 Yes  1.2 No

If yes, which one (even when it's different from ones above)?

.....

*1- Fully, 2- Mostly, 3-Medium, 4- Poorly, 5- Not at all*

Nr.	Question	1	2	3	4	5
<b>1</b>	<b>Is your company familiar with the system standards?</b>					
1.1	Quality management system ISO 9001					
1.2	Assurance quality system HACCP					
<b>2</b>	<b>Do you consider it necessary to have certification for the systems?</b>					
2.1	Quality management system ISO 9001					
2.2	Assurance quality system HACCP					
<b>3</b>	<b>Do you fulfill the requirements of systems standards?</b>					
3.1	Quality management system ISO 9001					
3.2	Assurance quality system HACCP					
<b>4</b>	<b>Are you willing to invest in certification of respective established management systems?</b>					
4.1	Quality management system ISO 9001					
4.2	Assurance quality system HACCP					
4.3	Combined management systems ISO 9001/HACCP					

2. Do you think applying International and EU standards is necessary for?

2.1 Domestic markets  2.2 Regional markets  2.3 European markets  2.4 All

## II. CONSULTANCY FOR BUILDING UP AND IMPLEMENTING THE SYSTEM

### 1. Consultant institution for building up and implementing the pre-established system:

1.1 Nationality ..... Name .....

### 2. Consultancy duration for building up and implementing the pre-established system:

..... Months

3. Price of consultancy service for building up and implementing the pre-established system: ..... mil. Leke

4. Total expenses for building up and implementing the pre-established system: ..... mil. Leke

COMMENTS FOR SECTION C

.....  
.....  
.....

*SECTION D* APPRAISAL OVER CERTIFICATION WITH RESPECT TO QUALITY MANAGEMENT AND QUALITY ASSURANCE SYSTEMS

I. CERTIFICATION OF PRE-ESTABLISHED SYSTEM

**1. Is your pre-established management system certified/recertified?** Yes  No

2. Year of system certification: .....

**3. Duration of system certification:** ..... Months

**4. The positive effects of system certification:**

4.1 High  4.2 Low  4.3 No effects

**5. What kind of effects (If 4.1 or 4.2)?** 5.1 Internal  5.2 External  5.3 Both

Mention some of them;

.....  
.....

**6. Total expenses of system certification:** ..... mil. Leke

II. INSTITUTION OF PRE-ESTABLISHED SYSTEM CERTIFICATION

**1. Data on institution of system certification:**

Nationality ..... Name .....

2. Which is the amount of money you paid for system certification: ..... **mil. Leke**

*SECTION E* GENERAL REMARKS

II. GENERAL INFORMATION

**1. Year of the Foundation of the company:** .....

**2. Capital of the company:** 2.1 Albanian  2.2 Foreign  2.3 Mixed

**3. Number of the employees of the company:**

3.1 (1 – 10)  3.2 (11 – 50)  3.3 (51 – 250)  3.4 Over 250

**4. Annual turnover of the company in 2004 (in Lekë):**

4.1 Under 65 mil.  4.2 (65 – 910) mil.  4.3 (910 – 5200) mil.  4.4 Over 5200 mil.

**5. Products of the company:**

5.1 Number of the company's products: .....

5.2 Name of the principal product, the most crucial one in the activity of the company:

.....

.....

**6. Does the company feel the “strictness/difficulty” in the internal market?**

6.1 Yes

6.2 Somehow

6.3 No

**7. Percentage of the export in relation to the annual turnover of the company:**

7.1 Under 10 %  7.2 (10 – 30) %  7.3 (31 – 50) %  7.4 Over 50 %

**8. How many times has the company renovated its main product?** ..... times

**9. When did you renovate the production technology?** Year.....

**10. Nature of the difficulties the company faces in conducting the technological renovation and in completing the metrological renovation:**

10.1 Lack of tools for measuring the characteristics the products

10.2 Lack of financial tools for the financing production technologies

10.3 Others

**12. Have you invested in improving the hygienic-sanitation conditions of the production, preservation, transport, etc. of the products in these years?**

2003-2004  2005-2006  Last three years

**13. Areas where the company has done trainings:**

- 13.1 Product quality & safety  13.2 Technology of production  13.3 Marketing   
 13.4 Management  13.5 Others

Specify.....

**14. What is the educational level of your managerial team and staff (cross the appropriate)?**

*Note: 1. Elementary school 2. High school or equivalent 3. Technical school or college  
 4. Bachelor's degree 5. Master degree 7. Doctor degree 8. Other*

*(If possible give numbers for each category)*

Category of employee	1	2	3	4	5	6	7	8
Managers high level								
Managers medium level								
Managers low level								
Technical staff								
Workers								

14. Sub-sector where the company is part of (multiple answer possible):

- 14.1 Meat - Sausages  14.6 Fish  14.9 Oil   
 14.2 Water  14.7 Milk  14.10 Eggs   
 14.3 Drinks  14.8 Poultry  14.11 Others   
 14.4 Pastries   
 14.5 Fruit Vegetables

*Thank you very much for your time and support*

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