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The European certification schemes as a warranty tool and enhancement to high quality food production: the Piedmontese PDO cheeses

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Abstract. Introduction: the high quality foodstuff covered by the *National Economy of Taste* is being severely threatened by distortions of the facts in the system, which are also anti-economic, such as commercial fraud. Indeed, in some more serious cases, such frauds may even turn into food alerts, running the risk of causing serious injury to the consumers' health. The European Union has implemented a set of tools targeted at reducing the risk of food crises, thanks to the food safety and commercial fraud legislation, with the implementation of some Food Quality Certification Schemes. Objectives: this research has two objectives, one is the assessment of the efficacy of the quality systems as a tool against counterfeiting and a means to contain the more general phenomenon of food commercial fraud e.g. Agro-piracy and Italian Sounding. The other is the dissemination of the fact that these systems may also be applied to achieve positive economic results. Data and Methods: this study analyzed the Protected Designation of Origin of Piedmontese cheeses. The data was collected in collaboration with the authorities for the control and protection of products bearing the PDO denomination. Results: the resulting data emphasized how the implementation of quality systems into the Piedmontese dairy supply chain bore fruit in terms of advantages to the sector, involving both business and quality. The control activities within the PDO system are a useful tool to fight the commercial/health fraud phenomena. Conclusions: food quality is one of main objectives the European Union set within the sphere of multifunctionality in agriculture. Therefore, it is of particular importance that the rural development programmes make contributions linked to the implementation of the European quality systems.

Keywords: Food fraud, PDO, Cheese, Piedmontese
JEL Classification: L66; M21, Q11; Q13; Q18

1 Introduction

The last thirty years have witnessed numerous cases of food frauds and food alerts. Consequently, the serenity of the European consumers have been undermined from both a safety and economical point of view.

As is common knowledge, food fraud means the production, detection, commerce, sale and/or delivery of foodstuffs that do not meet the requirements established by law. The latest tendency is to distinguish between a safety fraud, a potentially dangerous action for the health of the consumer and a commercial fraud, an action that produces illegal income to the detriment of the consumer.

There are three kinds of phenomenon of food product alteration: *alteration* in terms of the natural degenerative phenomenon of the composition and organoleptic characteristics of a product due to an incorrect preservation method; *adulteration* i.e. detraction or addition of some components of the food; *sophistication* i.e. total or partial modification of food, due to a total or partial replacement of some components of the product with others at a lower price (Peira et al., 2014; Varese, 2016).

At a European level, the Bovine Spongiform Encephalopathy (BSE) disease, commonly known as "Mad Cow" disease, is the most important, regulated (EC Regulation n. 1760/2000) and maybe overestimated (Ellis et al., 1992; Billette De Villemeur et al., 1992; Will et al., 1996; Weber et al., 1997; Weihl and Roos, 1999) case among the food alerts. However, some alert cases i.e. dioxin (Loeber et al., 2011; Verbeke, 2001; Nemery et al., 2002; Banati, 2011), bacteria (Cantoni et al., 2003; Bevilacqua et al., 2006; Nogarol et al., 2013), additives (Commission Decision, 2003; Tateo and Bononi, 2004) and flu (Babakir-Mina et al., 2007) are a clear example of potential food risks (RASFF, 2015).

This paper aims at the assessment of the efficacy of the European quality systems, both as a tool against food fraud and as an economic tool to achieve positive results.

2 Literature review

In the course of time, the European Union has modified the food quality and food safety regulations in an attempt to gain the confidence of the consumers again, after it having been greatly reduced by the numerous food scandals. The English language uses two terms to translate the Italian term "sicurezza alimentare". One is "food security" which is built on three pillars i.e. food availability, food access and food use and the other, "food safety" which is the fourth pillar i.e.

the warranty of healthy and safe food. The World Food Summit of 1996 defined "food security" as existing

> "when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life" (WHO, 1996)

After, Amartya Sen defined "food security" as

> "Food security [is] a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FAO, 2003)

The European Union imposes strict production requirements and guarantees high quality standards for food safety in the EU market. The first objective of European food policies is the safeguarding of public health, but also the protection of the economy and the environment. Indeed, the environmental footprint may influence food production and the EU is the biggest world producer of food and beverages (European Commission 2000). As to food safety, the European Parliament has adopted both horizontal regulations, where the articles are relevant for all foodstuffs and vertical regulations, that are applicable on single products e.g. the aforementioned EC Regulation No. 1760/2000.

The recent European food policy contemplates the full supply chain and considers all stakeholders in the sector, from feed and seed to the table. The regulation development has produced the EC Regulation No. 178/2002 "laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety" and the "hygiene package" in 2004 (EC Regulation Numbers 852, 853, 854 e 882/2004 etc.).

2.1 The European Quality Systems

The European Union offers three different kinds of tool for the enhancement of typical products and beverage aimed at safeguarding the European consumer both from diseases and ensuring true information and communication. The wine sector is regulated by the CMO Wine (EC Regulation No. 479/2008) that also defines the denominations as to Quality Wines Produced in Specified Regions; the spirits sector is regulated by the EC Regulation No. 110/2008 on the definition, description, presentation, labelling and the protection of geographical indications of spirit drinks; the other food products are regulated by the EU Regulation No. 1151/2012 on quality schemes for agricultural products and foodstuffs.

This work is dedicated to the typical cheese productions in Piedmont and in this context only the EU Regulation No. 1151/2012 is presented. This regulation, also called "quality package", is the result of an intensive collaboration between food quality stakeholders and the EU. The Green Papers (European Commission, 2008; European Commission, 2011) and the "Improving communication on agricultural product quality" (2009) and the following regulations have allowed for the definition of the modern strategies set-up to develop the food sector and to ensure true information for the European consumer.

The "quality package" confirms the food quality schemes i.e. Protected Designation of Origin (PDO), Protected Geographical Indication (PGI) and Traditional Speciality Guaranteed (TSG) and introduces the new labelling schemes, named Optional Quality Terms, dedicated to "mountain product" and "product of island farming".

For the purpose of this study, it is necessary to emphasize the quality schemes that have a high tie with the territory and, therefore, shown under the definition of PDO and PGI on "quality package":

> " 'designation of origin' is a name which identifies a product: (a) originating in a specific place, region or, in exceptional cases, a country; (b) whose quality or characteristics are essentially or exclusively due to a particular geographical environment with its inherent natural and human factors; and (c) the production steps of which all take place in the defined geographical area." (EU Regulation No. 1151/2012, Article 5.1)

and

> " 'geographical indication' is a name which identifies a product: (a) originating in a specific place, region or country; (b) whose given quality, reputation or other characteristic is essentially attributable to its geographical origin; and (c) at least one of the production steps of which take place in the defined geographical area." (EU Regulation No. 1151/2012, Article 5.2)

2.1.1. Counterfeit, Agro-piracy and "Italian sounding"

The European "quality package" enhances the high quality production of foodstuffs and their tie with the territory, but it is also a useful tool to fight counterfeit and agro-piracy. Over time, the typical products and the European food style have seduced the world's consumers and the economic success that followed intensified the food fraud phenomenon i.e. counterfeit, agro-piracy and, for the Italian case, the "Italian sounding" approach i.e. something that seems to be Italian but it is Italian-like.

Nowadays counterfeiting and agro-piracy have become a widespread phenomenon with a global impact (Varese and Caruso, 2011). What is the difference between counterfeiting and agro-piracy? Though these two terms are generally used as synonyms, the enforcement section of an agreement on intellectual property rights, negotiated in the World Trade Organisation (WTO), known as the TRIPS Agreement (Agreement on the Trade-Related aspects of Intellectual Property Rights), contains the following definitions:

> "Counterfeit trademark goods shall mean any goods, including packaging, bearing without authorization a trademark which is identical to the trademark validly registered in respect of such goods, or which cannot be distinguished in its essential aspects from such a trademark and which thereby infringes the rights of the owner of the trademark in question under the law of the country of importation".

This can be interpreted as being something made in imitation of something else with the intent to deceive. Counterfeit goods are unauthorized imitation of branded goods.

> "Pirated copyright goods shall mean any goods which are copies made without the consent of the right holder or person duly authorized by the right holder in the country of production and which are made directly or indirectly from an article where the making of that copy would have constituted an infringement of a copyright or a related right under the law of the country of importation."

Piracy consists in an illegal copy of something that already exists. It is an unauthorized exact copy (and not a simple imitation) of an item covered by an intellectual property right. In order to clarify the phenomenon, according to the Green Paper "Combating counterfeiting and piracy in the single market" (European Commission 1998), this article consider that concept of counterfeiting and agro-piracy will cover

> "all products, processes and services which are the subject-matter or result of an infringement of an intellectual property right (trade mark or trade name, industrial design or model, patent, utility model and geographical indication), of a copyright or neighbouring right (the right of performing artists, the right of producers of sound recordings, the right of the producers of the first fixation of films, the rights of broadcasting organization), or of the "sui generis" right of the marker of a database. This wide scope will make it possible to cover not only the case of products which are copied fraudulently ("fakes"), but also the case of products which are identical to the original but which are made in the Community [European Union] without the rightholder's consent, such as products resulting from an exceeding of the production run authorized by the rightholder".

Moreover, some authors (Sirotti Gaudenzi, 2010) state that there is a relationship of "*genus ad speciem*": piracy is a kind of counterfeiting.

A particular kind of Italian food fraud is the phenomenon of "Italian sounding". In this case, some non-Italian foodstuffs have a recall to Italy and Italian style cooking, without meeting the requirements to do so, in order to take advantage of the "made in Italy" brand e.g. "Parmesan" in place of "Parmigiano Reggiano" (Cembalo et al. 2008).

In any case, the marketing of such goods and indeed all goods infringing intellectual property rights, does meaningful damage to law-abiding manufacturers, traders and to right-holders, as well as deceiving and in some cases endangering, the health and safety of consumers (Varese and Bonadonna, 2012).

2.2 Piedmontese IG food production

Piedmont is a very rich territory in typical food products and currently it could even enhance the local Economy of Taste as an economic tool. The food system has gone in two different directions over the last two decades. On the one hand, the regional food value chains have been oriented to the implementation of quality food systems; on the other, both the food operators and the consumers have changed the meaning of *food quality*.

The Piedmontese Economy of Taste (Peira et al., 2016) is divided into GI food products, GI wines and spirits, Traditional food Products and Organic products. The first category is made up of 20 Geographical Indication (GI) products, 13 of them are PDO products and 7 PGI products. The ISMEA database shows that the whole GI production value amounted to 196 million Euro in 2011, versus 134 million Euro in 2006; in 2011 the enterprises involved were 2,881. The latest data (ISTAT, 2013) showed a reduction in the number of enterprises (2,689) and an agricultural useful surface of 4,933 hectares. The Wine and spirit sector includes 58 PDO wines, 16 of them are DOCG and 42 DOC and 4 European denominations for spirits i.e. “Grappa di Barolo”, “Grappa Piemontese/Grappa del Piemonte”, “Genepì del Piemonte” and “Genepì des Alpes - Genepi delle Alpi”. There are 341 Traditional Food products on the National List of PAT and there are also 1,998 enterprises and 28,876 hectares involved in Organic production.

3 Aim, materials and methods

This study analyzed the Protected Designation of Origin of Piedmontese cheeses. In this case, the 6 Piedmontese PDO cheeses selected were Bra, Castelmagno, Murazzano, Raschera, Robiola di Roccaverano, Toma Piemontese. The necessary element for inclusion in the study is that the production phases must be carried out exclusively in the Piedmont area. That is why Gorgonzola, Taleggio and Grana Padano were excluded. There will be a short description of the 6 cheeses included.

BRA. Description. Cow’s milk cheese, which can be supplemented with sheep’s and/or goat’s milk, half-fat, pressed, with a soft and hard texture, medium mature and mature, cylindrical in shape with straight sides. **Geographical area**. The entire territory of the province of Cuneo and the adjacent commune of Villafranca Piemonte in the province of Torino, forming a continuous area. **Background**. The cheese, historically produced in the province of Cuneo, is named after the commune of Bra, where, traditionally, most of its market lies. Over time the product has retained its original characteristics due to an established production technique. **Production method**. The curds, obtained from semi-skimmed milk, coagulated with calf's rennet at a temperature not higher than +32°C, undergo cutting twice and are then pressed in suitable moulds, dry salted twice and are left to ripen for a medium length of time.

CASTELMAGNO. **Description**. Half-fat cheese made from cow's and/or sheep's and goat's milk added in small quantities, pressed and semi-hard, containing herbs, ripened, cylindrical in shape with straight side. **Geographical area**. Communes of province of Cuneo which form a continuous area. **Background**. Historically the cheese was always made within the confined mountainous area, defined by the production regulations, retaining unchanged its original characteristics due to the particularly restricted area. **Production method**. The curds, obtained from semi-skimmed milk with rennet added at a temperature of between +35 and +38°C, are pressed in suitable moulds. The product is dry salted and sent to mature for a few months in cool and humid natural caves.

MURAZZANO. **Description**. Cheese made from sheep's milk which can be supplemented with cows' milk, full fat, uncooked, cylindrical in shape with straight sides. **Geographical area**. Communes of the province of Cuneo, forming a continuous area. **Background**. Historically made within the area defined by production regulations, the name of the cheese referes to the commune of Murazzano where most of it is made. Over time the product has retained its peculiar characteristics acquired due to the environment found in the Piedmont region. **Production method**. The curds, obtained from whole milk with addiction of calf's rennet, coagulate at a temperature of +37°C, are dry salted and are left to ripen for a short time.

RASCHERA. **Description**. A half-fat, soft cows' milk cheese which can be supplemented with sheep's and/or goats' milk, pressed, medium-mature and cylindrical or rectangular in shape with straight sides. **Geographical area**. The entire province of Cuneo. **Background**. The cheese, which is historically found in the territory of the province of Cuneo, is named after Lake Raschera in the area overlooking Monregalese, where the cheese was originally produced; the cheese has retained its original characteristics due to its being made by an established technique. **Production method**. The curd, obtained from semi-skimmed milk coagulated with calf's rennet at a temperature of not more than +30°C, is pressed in suitable moulds, is dry salted twice and matured for a medium length of time.

ROBIOLA DI ROCCAVERANO. **Description**. Cows' milk cheese with added goats' and sheeps' milk, uncooked, cylindrical in shape with slightly edged straight sides. **Geographical area**. The communes of the provinces of Asti and Alessandria, forming a continuous area. **Background**. Etymologically, this cheese of very ancient origin, as confirmed by references dating back to the medieval period, contains both the Latin name "robium" which refers to the reddish colour of the outside of the curds and the name of the village of Roccaverano in the Asti region where the product originated, made by specific techniques which have been retained in line with established local practices. **Production method**. The curds, obtained from semi-skimmed milk with rennet added, are allowed to mature naturally in a suitable environment for a few days.

TOMA PIEMONTESE. **Description**. Cows' milk semi-cooked cheese, divided into two types, whole milk and semi-skimmed milk, ripened fro a longer or shorter time depending on the dimensions, cylindrical in shape with straight or almost straight sides with slightly convex base. **Geographical area**. The entire territory of the provinces of Novara, Vercelli, Biella, Torino e Cuneo and adjacent communes of the province of Asti and Alessandria, forming a single geographical area. **Background**. The etymology of the name derives from the traditional name of the cheese produced in the relevant area of production, consisting mainly of mountainous zones and foothills. Over time, the local customs, varying from valley to valley in the region, resulted in two different types of cheese historically distributed on the consumer market. Given the long tradition of the product, the specific characteristics of the "Toma" cheese were outlined in the Ministerial Decrees of 24.11.1964 and 16.9.1977, which were followed by the D.P.M.C. of 10.5.1993, introducing production and product-naming regulations regarding the name of origin "Toma piemontese". **Production method**. The curd, obtained from whole or semi-skimmed milk with calf's rennet added, is cut twice into fine pieces, then it is placed into suitable vats and is salted, pressed and ripened in appropriate premises.

Source: extrapolated from the EUROPEAN COMMISSION. DOOR -AGRICULTURE AND RURAL DEVELOPMENT. http://ec.europa.eu/agriculture/quality/door/list.html (04.03.2016)

The following data were collected in collaboration with the authorities for the control and protection of products bearing the PDO denomination: Assopiemonte, INOQ, Regione Piemonte.

4 Results

The data obtained in the survey enabled us to better understand the situation of Piedmontese PDO cheese chain. This chain involves several stakeholders i.e. livestock farmers, milk collectors, producers, cutters and ripeners.

A total of 878 livestock farmers were involved in the production of the six Piedmontese PDO cheeses: - 16.46% in the period 2008/2014, 79 producers, 98 in 2010, 21 cutters (Bra, Raschera and Toma Piemontese), 21 milk collectors (Bra, Raschera and Toma Piemontese) and 109 ripeners in 2014. The highest number of livestock farmers (365) producers (20) and ripeners (30) are involved in the production of *Toma Piemontese*. The Raschera PDO chain is the most complete as it involves 235 livestock farmers, 16 producers, 11 cutters, 9 milk collectors and 24 ripeners.

Table 1 Quantities of Piedmontese PDO cheeses from 2008 to 2014

Quantities (tonnes)	2008	2009	2010	2011	2012	2013	2014
Bra	762	937	783	726	705	725	654
Castelmagno	197	216	227	223	228	196	213
Murazzano	21	16	16	13	13	14.5	14.79
Raschera	780	745	836	801	720	751	775
Robiola di Roccaverano	84	88	109	104	99	98	100
Toma Piemontese	1077	1048	1065	978	1088	1001	999

Source: Internal elaboration from data provided by Assopiemonte, INOQ, Regione Piemonte (2015)

This study analyzes the economic trends of six Piedmontese PDO cheeses, between 2008 and 2014. The certified Bra PDO production is quite stable, at over 700 tonnes, with the exception of 2014 when the production dropped to 654 tonnes. Only in 2009, did the certified production pick up and reach over 900 tonnes (Table 1).

Whilst, the production of Castelmagno increased to reach a peak of 228 tonnes, between 2008 and 2012 and went back to 196 tonnes in 2013, which was similar to the amount produced in the years 2007 and 2008. It then increased again in 2014. Castelmagno production is lower than the other Piedmontese cheeses. Indeed, it is a very high quality niche foodstuff, as only selection ingredients and skilled craftsmanship are used, meaning that this cheese necessitates more time and attention than a less precious one.

Murazzano production is less than the others, mainly because it is less well-known outside its territory, even if it is greatly appreciated in its area of origin. The quantities produced and marketed decreased over time, to a record low over the study period of 16 tonnes in 2009, which did not change in 2010. This downward trend continued throughout 2011-2012, when there was a production of 13 tonnes. However, the following two years witnessed an inversion of this trend with a recovery of the certificated output, which reached 14.79 tonnes in 2014. There was a rather fluctuating trend for Raschera production, although the quantity produced came close to that of the Bra production. Robiola di Roccaverano was also produced in small quantities (Table 1). Indeed, the certified production in 2008 - 2009 was less than 90 tonnes, which then took an upward trend to reach 109 tonnes in 2010. The production then stabilized at about 100 tons over the following 4 years. This placed it at the same level of Castelmagno as the only foodstuffs which recorded an increase in their certificated quantity over the period under study. Last but not least we observed that Toma Piemontese had the highest production up until 2011, when there a slow decreasing trend set in, which rose in 2012 an then dropped again to a low peak 2012 of 1,088 tonnes, before leveling off at slightly lower levels, in 2013 2014.

Table 2 Average producer prices of Piedmontese PDO cheese 2008 – 2014

Average producer prices (€/kg)	2008	2009	2010	2011	2012	2013	2014
Bra	5.85	5.50	5.80	6.55	6.70	6.90	6.90
Castelmagno	12.00	11.80	11.70	12.00	12.50	13.00	13.00
Murazzano	11.00	11.50	11.50	11.50	11.50	11.50	11.50
Raschera	5.80	5.30	5.70	6.50	6.50	6.70	6.70
Robiola di Roccaverano	11.42	11.07	11.36	11.38	11.79	12.30	11.32
Toma Piemontese	5.30	5.00	5.40	5.90	6.10	6.40	6.40

Source: Internal elaboration from data provided by Assopiemonte, INOQ, Regione Piemonte (2015)

Another economic aspect of the analysis that came to light was that of the average producer prices of these cheeses (Table 2). All the Piedmontese PDO cheeses, excluding the Robiola of Roccaverano, had a higher average origin price in 2014 than in 2008 (Table 2). The highest producer price was observed for Castelmagno, followed by the Robiola di Roccaverano which had reached its highest price in 2013. Whilst the price of the Murazzano remained stable at 11.50 €/kg from 2009 to 2014. The Bra and the Raschera had a more or less constant trend between 2008 and 2010, which then reached 5.80 €/kg and 5.70 €/kg over the following three years until arriving at 6.90 €/kg Euro and 6.70 €/kg respectively in 2014. Lastly, the Toma Piemontese fluctuated over the whole study period, even if it did show an increase in price between 2009 and 2014 (Table 2).

Table 3 Wholesale sales of Piedmontese PDO cheeses 2008 – 2014

Wholesale sales (Mio euro)	2008	2009	2010	2011	2012	2013	2014
Bra	4.458	5.154	4.541	4.755	4.724	5.003	4.513
Castelmagno	2.364	2.549	2.656	2.676	2.850	2.548	2.769
Murazzano	0.231	0.184	0.184	0.150	0.150	0.167	0.170
Raschera	4.520	3.950	4.770	5.210	4.680	5.030	5.190
Robiola di Roccaverano	0.959	0.974	1.238	1.184	1.167	1.205	1.132
Toma Piemontese	5.710	5.240	5.750	5.770	6.640	6.410	6.390

Source: Internal elaboration from data provided by Assopiemonte, INOQ, Regione Piemonte (2015)

The wholesale sales is yet another economic aspect of the Piedmontese cheese market (Table 3). Murazzano was the only cheese which had a lower price in 2014 than in 2008. The underlying factors in this situation is the fact that this was produced in the smallest quantity. Castelmagno reached its highest price in 2012, but maintained a stable trend over time of about 2.5 Mio Euro per year. Bra reached its peak price of over 5.1 Mio Euro in 2009 and then dropped slightly in 2011, to level off in 2012. The year 2013 witnessed a price increase, reaching 5 Mio Euro in 2013, which then levelled off in 2014, to 4.5 Mio euro.

Whilst Raschera had a fluctuating trend: after the lowest peak in 2009, due to both a reduced production and the high producers' prices. In 2011 the price was over 5 Mio Euro, before dropping in 2012, due to a reduction in the quantity produced. It rose to over 5 million in 2013 and levelled off in 2014 (table 3).

An unexpected finding was the fact that Robiola di Roccaverano increased its sales when it increased its prices and the quantity produced, between 2008 and 2010. Whilst the wholesale sales dropped to 1,1 Mio Euro in the period 2010-2014.

Lastly, there an inverse trend to that reported for Toma Piedmontese for Toma Piemontese wholesale sales. Indeed, in 2009, they dropped along with the producers' prices only to increase again in 2010 and 2012, in line with an increase in both the producers' price and quantities produced. Once again the sales trend followed the production trend in 2013-2014, when production dropped (Table 3).

The research was completed by including a comparison between of the average consumer prices (Table 4) for Piedmontese PDO cheeses to retail sales (Table 5). Castelmagno had the highest average consumer prices although they were slightly unstable compared to the average producer prices. This was due to fluctuating quantities put onto the market which was uncontrolled and, therefore, led to a devaluation of the price per kilo.

Table 4 Piedmontese PDO cheese value according to the average consumer prices (retail) (2008 – 2014)

Average consumer prices (€/kg)	2008	2009	2010	2011	2012	2013	2014
Bra	12.11	11.34	11.11	11.76	12.07	11.76	11.38
Castelmagno	24.31	25.81	25.61	25.77	26.25	25.64	25.74
Murazzano	17.90	17.68	18.00	18.00	18.00	18.00	15.67
Raschera	15.45	14.78	14.80	15.52	16.18	15.16	15.20
Robiola di Roccaverano	17.82	17.47	17.76	17.78	18.19	18.70	17.72
Toma Piemontese	10.91	10.83	10.15	11.00	11.11	10.40	10.25

Source: Internal elaboration from data provided by Assopiemonte, INOQ, Regione Piemonte (2015)

The Murazzano followed with a stable price of 18 €/kg between 2010 and 2013. There was then a decrease in the average consumer price which reached 15.67 Euro in 2014. The average consumer price of Robiola di Roccaverano increased over the period between 2009 and 2013.

The average consumer price of Bra fluctuated over time. Interestingly, it was the only cheese that showed an increase in its average price in 2008. Lastly, the Raschera and Toma Piemontese had discontinuous prices in the period under study, which reached a peak in 2012. The data show that Castelmagno is the only cheese which recorded an average higher price in 2014 than in 2008.

Table 5 Consumer sales of Piedmontese PDO cheeses 2008 – 2014

Consumer sales (Mio Euro)	2008	2009	2010	2011	2012	2013	2014
Bra	9.224	10.620	8.699	8.538	8.509	8.522	7.443
Castelmagno	4.789	5.575	5.813	5.747	5.985	5.025	5.483
Murazzano	0.376	0.283	0.288	0.234	0.234	0.261	0.232
Raschera	12.050	11.010	12.370	12.430	11.650	11.380	11.780
Robiola di Roccaverano	1.497	1.537	1.936	1.849	1.801	1.833	1.772
Toma Piemontese	11.750	11.350	10.810	10.760	12.090	10.410	10.240

Source: Internal elaboration from data provided by Assopiemonte, INOQ, Regione Piemonte (2015)

The Bra reported the highest consumer sales with 10.6 Mio Euro in 2009, due to the increase of the quantity sold and went back to 7.4 Mio Euro in 2014. There was a consumer sales difference of 1.7 Mio Euro between 2008 and 2014. The difference between the consumer and wholesale sales doubled in 2008 and 2009, whilst in the following years, the gap reduced to 3 Mio Euro by 2014. Castelmagno reached a stable value over time, thanks to the compensation of prices or that is there was an inverse trend, while the average consumer prices decreased the volume of sales increased. In 2014, the consumer sales were higher, reaching about 0.6 Mio Euro more than 2008. The consumer sales almost doubled compared to the producer sales over the study period analyzed.

Murazzano consumer sales decreased, as the production dropped between 2008 and 2012. It rose slightly, then arrived at its lowest peak of 0.23 Mio Euro, in 2014. The gap between the consumer and wholesale sales diminished from 144,900 Euro (2008) to 84,500 Euro (2012), which then took an upward trend to reach 94,250 Euro in 2013 and levelled off at 61,670 Euro, in 2014.

Raschera consumer sales fluctuated over time and were about 300,000 Euro less in 2008 than in 2014. The difference between the consumer and wholesale sales tripled between 2008-2011 then doubled between 2013-2014.

Robiola di Roccaverano consumer sale increased between 2008 and 2010, as the production increased then reduced until to 2014 where it was higher than in 2008. The consumer and wholesale sales were quite stable and remained at a level of 600,000 Euro over the whole study period.

Lastly, Toma Piemontese consumer sales were lower in 2014 than in 2008 by about 1.3 Mio Euro, as production was low and prices dropped. The consumer and wholesale sales doubled in 2008 and 2009 then fell by about 4 Mio Euro in 2014.

5 Conclusions

The "trip" the Economy of Taste took, led to the rediscovery of territorial deep-rooted typicalities, emphasizing the specific local identity that combines a significant economic weight to abstract features of its cultural heritage. Moreover, the research brought to light, not only the diversification, but also the variety and identity of the foodstuffs produced in the Italian Regions. Therefore, the ECC regulations on production and commercialization use the definition, "easily obtainable" and "specific character", which mean "the feature, or set of features which clearly distinguish/es an agricultural product or foodstuff from other similar products or foodstuffs, belonging to the same category" (Regulation ECC n. 2082/92, Art. 2).

In this sense, *typical foodstuff* is taking on its own peculiarities, which differ from the definition of *specialty,* which reduces the value attributed to the brand itself, whilst accentuating the intrinsic value of the product. Indeed, each product has its own unique characteristics, both from a qualitative point of view and the established image. This means that the consumer is willing to pay more for these goods than for others and searches the market for what he/she wants, declining to accept any kind of substitute (Peira 2014; Cerquetti 2010).

The territorial roots merge with the traditions, culture, history and geography of Italy. The intersection of social and economic relationships both determine and define the Italian food products as *cultural* goods, constituting a testimony to the historical value of the national heritage (Bortolotto 2007). From an economic standpoint, although it is not always possible to distinguish a good quality product from one that is not so good, on the basis of the difference in price alone, there is a clear distinction in quality, which is not always known to the *general public* (MIBAC 2007). This makes protecting and developing the subculture of local food products a must.

The data obtained in the survey enabled us to better understand the situation of Piedmontese PDO cheeses, also taking into consideration the fact that the national and regional milk sector is going through a difficult period. Indeed, the elimination of the monitoring tools, at a European level, has plunged the Italian diary sector into a state of *semi-coma* that will surely lead to major *life saving* changes in this sector. It must also be born in mind that, in order to limit the negative effects caused by the new EU structural paradigms, Piedmont has implemented a number of project initiatives, such as the request for registration of Ossolano PDO (Regione Piemonte, 2002; Zeppa et al., 2003), which would constitute the seventh geographical indication of exclusively Piedmontese dairy produce and the introduction of "noble milk" (Renna et al., 2014) which has sensory organoleptic characteristics superior to those of conventional fresh milk.

The European food quality systems, which are controlled by selected third parties, by definition should allow for greater protection from harmful phenomena such as food piracy and counterfeiting. These measures, at least for the Piedmontese foodstuff sector, seem to have worked well. However, conversely, these problems have not all been solved satisfactorily for other geographical indications. Some exceptions to this rule include Mozzarella di Bufala Campana PDO (Camera dei Deputati, 2013). Unfortunately, delicate questions such as illegal economic flows obtained from some geographical indication products, may represent a target of interest also for those organizations that generate large capital, as they need to invest in profitable activities which are legally recognized (EURISPES, 2016).

Lastly, it is useful to remember that, so as to reduce and then illuminate such aforementioned phenomena on food fraud, the well-established public control activities, carried out by *Ispettorato Centrale della Tutela della Qualità e Repressione Frodi dei Prodotti Agro-Alimentari* (ICQRF, 2015) and other organizations e.g. *Nuclei Antifrodi Carabinieri/Comando Carabinieri politiche agricole e alimentari* (NAC), there are also now the selected third parties who carry out severe product control. The Italian institutions involved in this action plan also provide for a budget of several million Euro for the implementation of a promotional campaign against "Italian sounding" in the United States and Canada and the creation of a brand that can identify the product unequivocally as being "Made in Italy" (MIPAAF, 2015).

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References

BABAKIR-MINA M. - BALESTRA E. - PERNO C.F. - AQUARO S. (2007), *Influenza virus A (H5N1): a pandemicrisk?*, in New microbiologica, 30: 65-77.

BANATI D. (2011), *Consumer response to food scandals and scares*, in Trends in food science & technology, 22: 56–60.

BEVILACQUA A. - CORBO M.R. - D'AMATO D. - SINIGALLIA M. (2006), *Microbialcharacterization of water-buffalo mozzarella cheese from Apulia,* in Industrie alimentari, XLV (467): 1121-1129.

BILLETTE DE VILLEMEUR T. - GOURMELEN M. - BEAUVAIS P. - RODRIGUEZ D. - VAUDOUR, G. - DESLYS J.P. - DORMONT D. - RICHARD P. - RICHARDET J.M. (1992), *Maladie de Creutzfeldt-Jakob chez quatre enfants traites par hormone de croissance*, in Revue neurologique, 148(5): 328-334.

BORTOLETTO N. - MINARDI E. (2007), *I distretti del gusto: nuovi sistemi produttivi di loisir, tra deficit di politiche e i nuovi processi di sviluppo locale, Department of Communication*, Available on http://wp.comunite.it/data/wp_no_30_2007.pdf

CAMERA DEI DEPUTATI (2013), *Commissione parlamentare di inchiesta sui fenomeni della contraffazione, della pirateria in campo commerciale e del commercio abusivo*. Atti parlamentari, XVII Legislatura.

CANTONI C. - STELLA S. - COZZI M. - IACUMIN L. - COMI G. (2003), *Blue colouring of mozzarella cheese*, in Industrie alimentari, XLII (428): 840-843.

CEMBALO L. - CICIA G. - DEL GIUDICE T. - SCARPA R. - TAGLIAFIERRO C. (2008), *Beyond Agropiracy: The Case of Italian Pasta in the United States Retail Market*, in Agribusiness, 24(3): 403-413

CERQUETTI M. (2010), *Dall'economia della cultura al management per il patrimonio culturale: presupposti di lavoro e ricerca, Il Capitale Culturale*, Studies on the Value of Cultural Heritage, Vol. I, 2010, EUM Edizioni, Università di Macerata

COMMISSION DECISION (2003), *On emergency measures regarding hot chilli and hot chilli products*, Available on http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:154:0114:0115:EN:PDF.

COMMISSIONE DELLE COMUNITÀ EUROPEE (2000), *Libro Bianco sulla sicurezza alimentare*, Bruxelles, 12.1.2000, COM (1999) 719 definitivo, Available on http://eur-lex.europa.eu/LexUriServ/site/it/com/1999/com1999_0719it01.pdf.

COMMISSIONE DELLE COMUNITÀ EUROPEE (2008), *Libro Verde sulla qualità dei prodotti agricoli: norme di prodotto, requisiti di produzione e sistemi di qualità*, Bruxelles, 15.10.2008 COM (2008) 641 definitivo, Available on http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0641:FIN:IT:PDF.

COMMISSIONE EUROPEA (2011), *Libro Verde. Politica di informazione e promozione dei prodotti agricoli: una strategia a forte valore aggiunto europeo per promuovere i sapori dell'Europa*, Bruxelles, 14.7.2011, COM (2011) 436 definitivo, Available on http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0436:FIN:IT:PDF.

ELLIS C.J. - KATIFI H. – WELLER R.O. (1992), *A further British case of growth hormone induced Creutzfeldt-Jakob disease*, in Journal of neurology, Neurosurgery and Psychiatry, 55: 1200-1202.

EU (2007), *The new Animal Health strategy (2007-2013): prevention is better than cure*, Available on http://ec.europa.eu/food/animal/diseases/strategy/index_en.htm.

EURISPES (2016). *Agromafie. 4° Rapportosui crimini agroalimentari in Italia*, Minerva Edizioni, Bologna.

EUROPEAN COMMISSION (1998), *Green Paper "Combating counterfeiting and piracy in the single market"*, Com (98)569 final. Accessed January 20. http://europa.eu/documents/comm/green_papers/pdf/com98_569_en.pdf.

FAO (2003), *Trade reforms and food security*, http://www.fao.org/docrep/005/y4671e/y4671e00.htm

ICQRF (2015), *Dipartimento dell'Ispettorato Centrale della Tutela della Qualità e Repressione Fordi dei Prodotti Agroalimentari. Report Attività 2014*, Available on https://www.politicheagricole.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/394

ISTAT (2013), *Rilevazione sui prodotti agroalimentari di qualità DOP, IGP e STG*

LOEBER A. - HAJER M. - LEVIDOW L. (2011), *Agro-food crises: institutional and discursive changes in the food scares era,* in Science as culture, 20 (2): 147-155.

MIBAC - MINISTERO PER I BENI E LA ATTIVITÀ CULTURALI (2007), *Libro Bianco sulla Creatività*, Available on http://www.beniculturali.it/mibac/export/UfficioStudi/sito-UfficioStudi/Contenuti/Pubblicazioni/Volumi/Volumi-pubblicati/visualizza_asset.html_1410871104.html

MIPAAF (2014), *Quattordicesima revisione dei prodotti agroalimentari tradizionali*, Available on http://www.politicheagricole.it/flex/cm/pages/ServeAttachment.php/L/IT/D/7%252Fa%252F0%252FD.f0ab2e9ee2902b95e1ec/P/BLOB%3AID%3D3276

MIPAAF (2015), *Piano per la promozione straordinaria del Made in Italy e l'attrazione degli investimenti in Italia*, Available on https://www.politicheagricole.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/9685

NEMERY B. - FISCHLER B. - BOOGAERTS M. - LISON D. - WILLEMS J. (2002), *The Coca-Cola incident in Belgium, June 1999*, in Food and chemical toxicology, 40: 1657-1667.

NOGAROL C. - ACUTIS P.L. - BIANCHI D.M. - MAURELLA C. - PELETTO S. - GALLINA S. - ADRIANO D. - ZUCCON F. - BORRELLO S. - CARAMELLI M. - DECASTELLI L. (2013), *Molecular characterization of Pseudomonas fluorescens isolates involved in the Italian blue mozzarella event,* in Journal of food protection, 76 (3): 500-504.

PEIRA G. - BONADONNA A. - SOSTER M. (2016), The Economy of Taste, Public Promotion and Information Models Applied by Italian Regions, in XXVII National Congress of Commodity Science – Proceeding, Viterbo 2-4 Mars 2016.

PEIRA G. - BONADONNA A. - ARNOLDI S. (2014), *La qualità nel settore agroalimentare Sistemi di qualità e strumenti innovativi*, Celid, Torino.

RASFF (2015), *Preliminary Annual Report*, Available on http://ec.europa.eu/food/safety/rasff/index_en.htm (14 . 03.2016)

REGIONE PIEMONTE (2002), *Il formaggio Ossolano. Uno studio per la caratterizzazione del territorio, dei sistemi produttivi zootecnici e dei formaggi*. Turin, Italy: Regione Piemonte – INTERREG II Italia Confederazione Elvetica

RENNA M. - LOMBARDI G. - PROBO M. - LUSSIANA C. - RAVETTO ENRI S. - DECASTELLI L. - BATTAGLINI L.M. (2014), *La filiera del "latte nobile" in Piemonte: caratteristiche delle aziende zootecniche e qualità nutraceutica e sensoriale del prodotto*, in Quaderno SOZOOALP, 8: 69-76

SIROTTI GAUDENZI A. (2010), *Proprietà intellettuale e diritto della concorrenza*, Milano, UtetGiuridica.

TATEO F. - BONOMI M. (2004), *Fast determination of Sudan I by HPLC/APCI-MS in hot chili, spices and oven-baked foods*, in Journal of agricultural and food chemistry, 52: 655-658.

VARESE E. (Eds) (2016), V.*E.DO. Vini Etichettature Dogane*, Giappichelli, Torino.

VARESE E. - BONADONNA A. (2012), *Turin university students' attitude and perception of counterfeit and piracy of goods: a preliminary study*, in 18th IGWT Symposium Technology and innovation for a sustainable future: a commodity science perspective, Rome September 24-28th, 2012.

VARESE E. - CARUSO F. (2011), *Commercio internazionale e dogane. Le dogane negli scambi internazionali*. GiappichelliEditore, Torino.

VERBEKE W. (2001), *Beliefs, attitude and behaviour towards fresh meat revisited after the Belgian dioxin crisis,* in Food and quality preference, 12: 489-498.

WEBER T. - OTTO M. - BODEMER M. - ZERR I. (1997), *Diagnosis of Creutzfeldt-Jakob disease and related human spongiform encephalopathies*, in Biomed and pharmacother, 51: 381-387.

WEIHL C.C. - ROSS R.P. (1999), *Creutzfeldt-Jakob disease, new variant and bovine spongiform encephalopathy,* in Neurologic clinics, 17(4): 835-859.

WILL R.G. - IRONSIDE J.W. - ZEIDLER M. - COUNSENS S.N. - ESTIBEIRO K. - ALPEROVITCH A. - POSER S. - POCCHIARI M. - HOFMAN A. - SMITH P.G. (1996), *A new variant of Creutzfeldt-Jakob disease in the UK lancet*, in 347 (9006): 921-925, doi 10.1016/S0140-6736(96)91412-9.

ZEPPA G. - GIORDANO M. - GERBI V. - ARLORIO M. (2003), *Fatty acid composition of Piedmont "Ossolano" cheese*, in Lait*,* 83: 167-173.