

# QUALITY AND TRACEABILITY AS A TOOL FOR A NEW COMMON AGRICULTURE POLICY IN EU\*

F. Arfini ([filippo.arfini@unipr.it](mailto:filippo.arfini@unipr.it))

C. Giacomini ([corrado.giacomini@unipr.it](mailto:corrado.giacomini@unipr.it))

M.C.Mancini ([mariacecilia.mancini@unipr.it](mailto:mariacecilia.mancini@unipr.it))\*\*

Sezione di Economia Agroalimentare – Dipartimento di Studi economici e quantitativi  
Università degli Studi di Parma – Via Kennedy 6, 43100 Parma  
2003

**SUMMARY** - The aim of this paper is to analyse the link between the traceability and the high quality agro-food products, showing how the traceability can be a valid instrument for increasing the responsibility of economic actors across the agro-food chain and incrementing the reputation of the typical products.

The paper will then present as “case study” the Parma Ham, that is one of the very few PDO products which have implemented a traceability system. This example will bring to light the level of effectiveness of the traceability system.

**Key words:** traceability, quality, PDO - PGI products.

## 1. INTRODUCTION

The support measures provided for by the Common Agricultural Policy for the agricultural sector have undergone radical changes over the years, brought about, among other things, by a new, more demanding and more knowledgeable type of consumer. For this reason, in order to satisfy the quality and safety needs, the European Union has had to back up traditional measures designed to boost agricultural income and rural development with new tools, which provide high food quality products, greater availability of information and quality and safety guarantees.

The study consists of two parts. The first considers a community legislative action designed to protect producers and consumers against moral hazard and unfair behaviour through the reduction of informational asymmetry and the organisational and managerial tools adopted, by producers such as the adoptions of “Code of practice”, systems of quality assurance and traceability systems. In particular, the link existing between the high quality agro-food products and the traceability systems is analysed, showing how traceability can be a valid instrument for increasing the responsibility of

economic actors across the agro-food chain and how can be represent an instrument able to increment the reputation of the typical products.

The second part of the paper presents the Parma Ham (Prosciutto di Parma) case study, that is one of the very few PDO products which have implemented a traceability system, started thirty years ago, through a code of practice which establishes strict regulations on origin and quality of pig meats, production phases, maturing and branding. The system examined consists in the creation of documents which accompany the meat through every phase of production and the use of indelible stamps to mark processed pork legs.

The example of a company case will bring to light the level of effectiveness of the traceability system, the development opportunities offered by the sector in terms of corporate strategies targeted to the needs of modern consumers and explain the trust to the Parma Ham Consortia and to all producers.

## **2. INFORMATIONAL ASYMMETRY IN THE AGRO-FOOD MARKET**

Many of the foodstuffs on the consumers' tables are the result of a series of processing stages carried out at different times and places by different categories of operators who perform a specific role in the supply chain, thus increasing the added value of the processed goods. There is a vast literature on this subject, starting with the studies by Malassis (1973), that shows how the present agrifood system is characterised by supply chains that are vertically integrated, often on a contract basis, and thus able to ensure a significant level of flexibility to the system as well as to keep pace with the changing needs and requirements of consumers.

Many supply chains therefore have agricultural "roots", an industrial "body" and a distribution "head"; in addition to manufacturing, processing and sales companies they usually also include what we refer to as "*Intermediate institutions*", associations and consortiums for the protection of products, whose function is to contribute to improving the flow of information between the different players involved in the various stages of the supply chain, including consumers. (Arrighetti and Serravalli, 1998, Giacomini and Arrighetti, 1999).

However, the biggest problem for the modern agrifood system seems to be that of establishing a straightforward relationship with consumers who are finding it increasingly difficult to assign to the food products they purchase the right commercial value based on the actual quality of the product. Consequently the definition of quality becomes the determining element on which consumers base

their food purchasing strategy. This strategy is influenced by the cost of the research required to guarantee the expected quality for a given product within specific budget constraints. In this respect some researchers (Nelson, 1970) have identified three categories of goods which have been defined as search goods, experience goods and trust or credence goods (Darby and Kami, 1973; Anania and Nisticò, 1999).

While the first two categories refer to intrinsic or extrinsic qualitative features that may be identified only after purchase or consumption, credence goods have to do with quality aspects of the product that consumers can detect only partially even upon consumption. In this case, as consumers are unable to fully judge the intrinsic characteristics of the product, they will base their choice mainly on the indications supplied by the producer.

To prevent misconduct on the part of producers and reduce consumers' uncertainty, goods which can be included in the "credence goods" category require that the trust granted be backed up either by the manufacturing company's brand or by what can be defined as "*official quality seals*" affixed by public authorities or private bodies approved by the government, i.e. by means of collective brands of a public or private nature (Tirole, 1988; Anania and Nisticò, 1999; Arfini 2000).

### **3. COUNCIL REGULATION (EEC) 2081/92**

Council Regulation (EEC) 2081/92, which lays down common rules on the protection of geographical indications and designations of origin for agricultural products and foodstuffs, provides an example of a legislative action aiming at reducing the phenomenon of "asymmetrical information". By means of these rules, the community legislator supplies the consumer with a guarantee as to the origin of the raw materials and/or production methods used, in a system whose transparency is ensured by the intervention of a public body.

Products bearing the protected geographical indication and designation of origin quality marks (PDO, PGI) are manufactured using raw materials and following methods laid down in a Code of Practice, approved by the European Union, periodically checked by independent bodies and recognised by the national legislator, that provides the consumer with a guarantee that the quality standards set down in the Code of Practice have, effectively, been met. Thus, through the system activated by Reg.(EEC) 2081/92 the information gap existing between producer and consumer is narrowed, and faith of the latter in typical products is reinforced. As a result of this process, a second objective is also achieved:

wealth is transferred to the producers involved. The exclusive right to use the registered name confirmed by Reg. (EEC). 2081/92 gives the producer an industrial property right in the real sense of the term, while the owner receives the economic benefit of the collective reputation acquired through the use of the name on the market. It is, nonetheless, important to point out that the collective property of these designations and indications is not confined to the group of producers that originally made the application, but can be extended to all those who manufacture the protected product according to the requirements laid down in the Code of Practice.

It is clear, therefore, that the second objective of the regulation does not limit itself to protecting the producers that existed prior to the regulation, but also extends to cover the promotion of typical products in parts of the community in which they are of fundamental importance to the local economy, representing the main source of income for the families resident in the area.

Undeniably, the application of this regulation in Italy encountered a series of difficulties in finding its appropriate location in an already consolidated, well-organised production market. The initiatives geared to inform consumers and safeguard producers were, in fact, formulated some time before the EU regulations were adopted, through the constitution of "Protection Consortia" (Consorti di Tutela). The precise task of the Protection Consortia was to guarantee the application of the rules laid down in the Code of Practice and to safeguard against unfair behaviour on the part of some producers, checking the quality of the goods before they were placed on the market. These consortium-type structures, which have in Italy contributed to the success of a large variety of agri-food products, now recognised as PDO – PGI products – examples such as the "Consorzio del Formaggio Parmigiano Reggiano" (Parmigiano Reggiano Cheese Consortium) and the "Consorzio del Prosciutto di Parma" (Parma Ham Consortium)– may be considered as "*intermediary institutions*" which, according to the theoretical approach provided by well-being economy, are coordinating institutions that reduce the costs of using the market (transaction costs), facilitating the passage of information to all actors involved, reducing their uncertainty and, in other words, contributing to efforts to avoid the development of situations likely to bring about a market failure (Coase, 1937; Williamson, 1985).

On account of the role they play, even following the checking functions progressively assigned by the national legislator, the Consortia have been instrumental in putting products on the market, guaranteeing their geographical origin, production techniques and quality, and in this capacity, they assume the role of "guarantor" vis à vis the consumer.

In order to carry out this role effectively, the Consortia have, over the past few years, organised production chains, using tools which, adopted by their member companies, have contributed to an improvement of the management of the activities carried out. An example of such tools are the ISO 9000 standard quality systems, thanks to which it has been possible to re-organise company activities and systematically record the processes carried out, thus helping increase involvement of the economic actors throughout the production chain and enhancing the reputation of the product in question.

Alongside the quality systems, which are now comparatively widespread in all the various production sectors, some Consortia have confirmed their commitment to a quality-promoting policy, thanks to new tools that have also been able to deal effectively with recent food scandals. These Consortia have already chosen to adhere, of their own accord, to a standard which will shortly become obligatory for all sectors of the food industry, by voluntarily adopting a traceability system.

In the PDO- PGI products sector, the choice to offer a guarantee of traceability has enabled some Protection Consortia to achieve two objectives at the same time; the first (internal) objective being the prevention of unfair behaviour by the consortium's associated enterprises and the second (external) objective being the sustaining and consolidating of the consumer's faith in the consortium's brand. The case study presented in the second part of this report demonstrates how the EU objective of the reduction of informational asymmetry, has been implemented, even through a system of traceability, and how it has, at the same time, valorised the policies of those intermediary institutions who have succeeded in forging a link between the quality guarantee sought by the consumer and the brand of the consortium itself.

#### **4. THE MEANING OF "TRACEABILITY"**

The concept of "traceability" has existed in voluntary standards for some time now, dating back, in fact, to 1987, to the first edition of the ISO 9000 standards, then known in Italy as UNI EN 29000, in which traceability was included among the requirements that the production organisation was obliged to comply with. Presently, in the third edition of this standard, traceability is defined as the "capability to retrace the history, use or location of an entity using recorded identification data". The same standard further clarifies that the term "traceability", in connection with a product, can also refer to the origin of the materials and component parts, the history of the processes to which the product was

subjected and the distribution and location of the product after its delivery. This concept is taken up again in point 7.5.3 of the standard UNI EN ISO 9001:00<sup>1</sup>, which states “when traceability is a requirement, the organisation must ensure that the product is uniquely identified, recorded and controlled.”

In the light of the food scandals that have broken out over the last few years, it becomes evident today that the main limitation of the above defined concept of traceability is the degree to which it is effectively applied within the sphere of the company itself. Although it is understandable that, as far as the company is concerned, the commitment to guaranteeing traceability does not go beyond its own area of responsibility, it is also true that, in order to fully safeguard the consumer’s interests, the traceability system should be extended to the entire processing and distribution chain.

To meet this need, UNI (Italian National Unification Body) published, in April 2001, a voluntary standard on food processing chain traceability which extends beyond the limits of the other standards approved up till now, requiring not only product traceability “within” each organisation, but also “between” the organisations involved in the training, distribution, marketing and supply of the product.

As already mentioned, the concept of traceability is gaining increasingly more ground also in the binding legislation.

The European Commission issued the “White paper on food safety”, a comprehensive analysis with the objective of providing increasing protection to consumers and improving the level of human health. As such, the first concern expressed in the White Paper is to correctly identify the responsibility of operators all along the food chain, stating that the primary responsibility for food safety lies with the producer and, only at a later stage, with Inspection authorities.

In addition to the extensive body of food regulations and the ever greater concern for health and for the well-being of animals, from which we obtain many of the products destined for consumption, the White Paper points out that despite the specific laws issued, emergency situations in the food sector can nevertheless occur. For this reason we need to devise measures that can be applied throughout every sector, trickling down through the product chain and leaving a trace at every stage. This means, in other words, adopting a system of traceability.

Making producers accountable by applying traceability procedures has the important effect of achieving greater transparency throughout the food system, while assuring consumers that in case of

---

improper conduct it will be possible to trace back to the people responsible and promptly intervene to isolate possible cases of “contamination” before the problem spreads through the whole food chain. For this reason product traceability, using systems which necessarily involve the whole supply chain, is considered a competitive factor, a means for providing consumers with information about the stages which lead back to the origin of the product, improving the reputation of both product and company.

More recently the Reg.(EEC) 178/2002 was published and this regulation sets 1st January 2005 as the date from which all food products will have to be accompanied by a traceability system which will permit the retracing of a foodstuff or fodder at any stage of the processing chain whatsoever<sup>2</sup>.

## **5. TRACEABILITY FOR PROSCIUTTO DI PARMA**

An example of the aspects mentioned above is the Consorzio del Prosciutto di Parma (Parma Ham Consortium – PHC) who, right from the moment of its establishment in 1970, actually adopted a system of traceability of the meat to be used for the production of Parma Ham, in order to check origin and compliance with the specification .

In this respect, the specification for Parma Ham establishes stringent production regulations, including: 1) prohibition on use of animal fats in pig feeds; 2) provenance of pigs exclusively from Italian stock farms; 3) pigs to be branded by farmer thirty days after birth.

The introduction of EC regulations on PDO and PGI typical products (Reg. 2081/92) has further motivated the PHC to adopt even stricter measures for the protection of Parma Ham. The new specification lodged with the European Union on the one hand fixes new and very rigid rules for production, storage and distribution methods which affect every type of company across the supply chain, and on the other hand identifies all the types of inspections which have to be carried out at each processing phase. As national protection gave way to EC protection, in January 1998 the CCP, pursuant to art.10 of Reg.2081/92, handed over the activity of supervising compliance with specification regulations to an independent body – Istituto Parma Qualità (IPQ) – but retained the functions of promoting and developing Parma Ham in Italy and abroad.

To verify compliance with the above requirements it was necessary, first for the PHC and today for the Istituto Parma Qualità (IPQ), to adopt a system of application of “marks” and registration of the various passages, which takes on the essential characteristics of a “traceability” system.

In detail, the traceability procedure takes place through the combined action of a number of successive phases, such as : a) affixing of identification marks (stamps and seals) on pork legs by farmers, slaughterhouses, producers and IPQ (Figure 1) and, b) completing a set of documents to accompany the pork legs across the entire supply chain (Table 1).

Fig. 1. Stamps, Seals and marks used for traceability of Parma Ham (Source: Consorzio del Prosciutto di Parma and Istituto Parma Qualità)

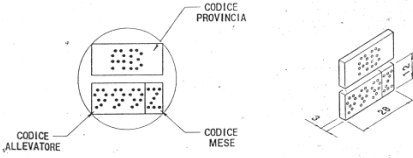
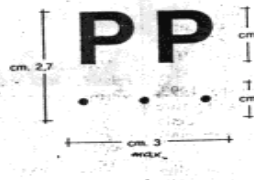
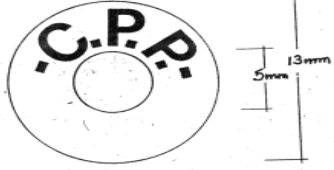
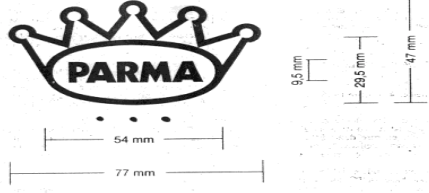
<p>Indelible stamp identifying breeder, to be stamped upon each pig</p>	
<p>Hot iron brand identifying slaughterer, to be branded upon each pork leg</p>	
<p>Seal to be applied to each pork leg before processing is started. The relief seal shows the CPP initials and the date processing was started (month and year)</p>	
<p>Brand to be applied to each pork leg at the end of processing. It represents a five-pointed coronet and contains the company identification code</p>	

Table 1. Summary of the procedures for both the methods which enable traceability of Parma Ham (Source: Consorzio del Prosciutto di Parma and Istituto Parma Qualità)

Phases	Actions	Procedures
1	Approval of all stock farms, slaughterhouses, ham factories of the PDO circuit and assignment of regular identification code	Companies' data Identification codes
2	Birth of pigs	Indelible tattoo on rear legs within 30 days from birth
3	Pigs transferred to different stock farm	"Certificazione Intermedia" (CI) (Intermediate Certification) issued
4	Pigs sent to slaughterhouse	"Certificazione Unificata di Conformità (CUC)" (Unified Conformity Certificate) issued for each shipment to slaughterhouse made by farm of origin
5	Inspection of lots of pigs arriving at slaughterhouse	<ul style="list-style-type: none"> <li>• Check CUC and compliance with specification requirements</li> <li>• Branding of approved pork legs with hot iron by slaughterer.</li> </ul>
6	Pork legs sent to cutting laboratory*(optional) or directly to the ham factory	Dichiarazione Cumulativa del Macello (DCM) (Cumulative Slaughterer Declaration) issued by slaughterhouse
7	*Cutting laboratory approved by Inspection Authority	Stamping and completing DCM prepared by slaughterer
8	Pork legs transferred to ham factories	Check DCM and compliance with specification requirements
9	Processing started	Seal applied before salting and Documento di Omologazione (DO) (Homologation document) issued.
10	Processing completed	Brand applied by Istituto Parma Qualità and certificate of conformity issued
11	Sale of ham pieces	Brand applied on each piece at authorized ham factories
12	Sale of pre-packaged slices	Brand applied on each package
13	Approval and identification of slicing and pre-packaging laboratories	Identification code assigned List of slicing and pre-packaging laboratories
14	Manufacturers of packaging materials	Contract for use of brand signed with Istituto Parma Qualità

Overall there are 14 phases each of which contains a specific procedure designed to deal with the actions interacting across the supply chain of Parma Ham. In operational terms, all stock farms must be recognized by the Parma Qualità Institute (IPQ) who will assign an identification code on the basis of criteria which take into consideration: a) differentiation by province, b) progressive numbering by province, c) diversification of code for each processing facility. As far as ham factories are concerned, they must comply with the requirements laid down by the specification, whether or not they have joined the PHC. The IPQ verifies that the application is adequate and acceptable and then assigns

an identification code, consisting in an alphanumeric code, which will become an integral part of the PDO brand that identifies the producer permanently (phase 1).

Breeders who wish to operate according to the provisions of the specification, receive the stamps to be applied to the piglets within a month of their birth, with an indication of the corresponding month (phase 2).

When the pigs are moved from the place of birth to the raising farms (phase 3) and/or to the slaughterhouses (phase 4) the breeder fills in a document which certifies that the pigs are fit for slaughtering and comply with the characteristics described in the specification.

In the slaughterhouse (phase 5), the pork legs which meet the specification requirements are stamped with the identification code assigned to the slaughterer by the IPQ. The stamp, applied in a visible position, certifies that the prescribed requirements have been fully met and makes the slaughterhouse responsible in case of non-compliance or infringements with respect to the specification. When the legs are dispatched from the slaughterhouse to the ham factory (phase 6) the slaughterhouse issues the "Cumulative Document" (DCM) which indicates the farm of origin of the slaughtered pigs.

When the pork legs reach the ham factories, the goods undergo a quality inspection to check compliance with the specification (phase 7 and 8) in order to complete the DCM form. If the inspection result is positive, the processing phase will start in the ham factories where the hams will be marked twice, once at the start of processing (phase 9) and again at the end of processing (phase 10). When processing is started, a metal seal is applied to each fresh pork leg which meets the requirements. The seals are given to the factory by the IPQ and they indicate the month and year in which processing was started. In this phase the *Homologation document* is also filled in; this document will accompany the ham throughout its life. At the end of the curing phase the ham factory must contact the IPQ who are in charge of branding the pork legs with a hot iron to apply the mark of conformity (phase 10). The brand consists in a five-pointed coronet, according to the indications given in the specification.

Once the ham has been branded it can be sold whole, cut into pieces of varying shape and weight, and pre-sliced in packages (phase 11 and 12). While there are no additional provisions for whole hams, in case of ham pieces or pre-sliced the application of the conformity mark on ham pieces and

packages must be carried out strictly at authorised ham factories or laboratories (phase 13) under the direct supervision of IPQ officials on the basis of a contract (phase 14).

The application of marks and stamps, although useful in terms of product traceability, cannot be considered to be fully functional for this purpose. By contrast, the collection and recording of documents represents the most rapid procedure used by inspection authorities to monitor the phases upstream the supply chain (stock farms and slaughterhouses).

In the analysis of the documentation which approved farms must complete to ensure compliance with specification requirements and traceability of the product all along the supply chain, a distinction must be made between breeding farms and raising farms. The former receive from the IPQ the *Certificazione Intermedia (Intermediate Certification)* (CI) forms while the latter use the *Certificazione Unificata di Conformità (Unified Conformity Certification)* (CUC). These forms are supplied complete with heading, code and number by the IPQ and are the only documents valid for issuing the CUC. The specification lays down very strict criteria in relation to genealogy and to the characteristics of pig feeds. The IPQ is in charge of supervising farms to ensure that they adhere to the provisions of the production specification. In the year 2000, 2.247 breeders were inspected, equal to 40% of the total (Source IPQ).

The most relevant documents in the process of traceability designed by the PHC are the *Dichiarazione Cumulativa del Macello (Cumulative Slaughterhouse Declaration)* and the *Documento di Omologazione (Homologation Document)*. The first document is sent by the slaughterhouse to the ham factory and also to the IPQ, who will arrange additional inspections both at the stock farm and at the slaughterhouse, notifying any *situations of non-conformity* (SNC) or infringement of the specification. A copy of the DCM is sent to the ham factory where it will be filed and will become an integral part of the "*Homologation Document*" (DO) issued for each lot received the day after the operation it refers to. This document contains all the data identifying the lot of fresh pork legs received and, in particular, information about the approved slaughterhouse of origin, details of the health/administration documents, the Declaration of conformity issued by the slaughterhouse and the total number of fresh pork legs stamped with the identification code of the slaughterhouse.

This document must also indicate: 1) the number of pork legs on which the seal has been applied; 2) the number of pork legs which did not obtain the seal, specifying how many of these were kept at the

factory, how many were returned to the slaughterhouse and how many were transferred to another factory.

The function of the Homologation Document is therefore twofold: on the one hand it is equivalent to a certificate of conformity with the provisions of the specification for the fresh pork legs on which the seal has been applied, on the other hand it provides a means for recording and tracking down even raw material which has been rejected as unfit for processing. Should the ham factory come across instances of non-conformity of pork legs following the application of the seal and the completion of the Homologation document, the seal will have to be promptly removed and the removal duly notified to the Inspection authority on a form especially designed for this purpose.

For each monthly production lot which has been through all the required processing phases and recorded in the register, the ham factory must fill in a declaration of self-certification to be filed in the factory's premises. The declaration must include: 1) full compliance with the production process laid down in the specification; 2) completion of the curing period; 3) conformity with the minimum weights required by the specification for the cured product and with the general characteristics of the product; 4) absence of irregularities of a technological, qualitative or sanitary nature.

It is clear that, with respect to both the application of stamps and the issuing/collection of documents relating to the various production phases of Parma Ham, the central role lies with the Istituto Parma Qualità, who is responsible for the required inspections. The IPQ is a private company, whose social base is made up by the associations which represent the three main groups of operators in the supply chain: 1) The Pork Breeders Association (Associazione dei produttori di Suini -UNAPROS) representing breeders; 2) The Meat Processors Association (Associazione Industriali delle carni-ASS.I.CA) representing slaughterers; 3) The Association for the protection of Prosciutto di Parma (Consorzio di Tutela del Prosciutto di Parma) representing ham producers.

In order to augment their inspection and supervisory capability, the Istituto Parma Qualità has associated with the Istituto Nord Est Qualità (INEQ). The latter is the certification institute for the PDO Prosciutto di San Daniele, and is based in Villanova di San Daniele del Friuli (Udine). This enables them to cover meat processing and production throughout the national territory. In addition to cutting costs, the coordinated management of supervisory activities has the advantage of optimising inspections and providing a greater guarantee in the phase of control and certification of all the protected productions in the Italian pork meat sector.

In addition to the activity they carry out for the Istituto Parma Qualità, the Consorzio del Prosciutto di Parma, through their inspectors, carries out a constant monitoring action at sales outlets to verify that hams are correctly stored and to prevent instances of non-compliance with the production specification. The overall supervision activity performed across the supply chain seems to be quite intensive if you consider that in the year 2000 45,8% of the breeders and 100% of the ham factories received an inspection. A total of 3,981 lots and 1,385,089 hams were checked, and the seal applied to 9,308,890 pork legs, 9,061,569 of which have been branded (Table 2).

Table 2. Supervisory activity by IPQ across the supply chain of Parma Ham (year 2000)

a. Players and figures for the supply chain of Parma Ham (Source: Istituto Parma Qualità)

Breeders (n°)	5,550
Slaughterhouses (n°)	163
Processing companies (n°)	201
Employees in processing companies (n°)	3,000

b. Breeders for the supply chain of PDO Parma Ham inspected in the year 2000

Type of farm	by IPQ staff (n°)	by external staff (n°)	Total (n°)
Weaning	115	386	501
Porker	6	36	42
Fattening	191	608	799
Closed cycle (CC)	213	692	905
TOTAL	525	1,722	2,247

c. Quality control activity on fresh PDO pork legs, at delivery

Activity	No. of inspections
No. Of inspections	1,558
Lots checked	2,062
Pork legs checked	711,327
Not approved for PDO	13.3 %
Pork legs marked with seal	9,308,890

d. Inspection of stamps on fresh PDO pork legs

Activity	Inspections
Lots checked	1,919
Pork legs checked	673,692
Clearly legible stamp	66.7%
Partly legible stamps	17%
Illegible stamps	16.3%

e. Inspection of seal application on hams

Activity	Inspections
Companies checked	276
Inspections performed	285
Hams checked	603,452
Hams not in conformity	1,557
% of non conformity	0.26

f. Inspection of hams presented for application of conformity mark

Activity	Inspections
Hams presented	9,125,052
Hams rejected by IPQ*	63,483
Marked hams	9,061,569
% of rejects	0.7
Marking suspended	39
Marking postponed	6
* Type of rejects: - low weight = 0.9% - appearance = 78.4% - needle defects = 20.7%	

**6. PROSPECTS: THE USE OF TRACEABILITY**

The analysis of the system of traceability of Parma Ham has shown us how it is possible to keep track of pigs and pork legs from the stock farm up to the time Parma Ham is sliced and vacuum packed.

In the first part of this paper we discussed the importance of traceability for consumers as it reassures them about the possibility of identifying responsibilities, but traceability is also useful for the company which applies it. In this respect the experience of Consorzio del Prosciutto di Parma and Istituto Parma Qualità can be considered to be very significant as their system of traceability involves the entire supply chain, providing a single method of supervision applicable to all the companies in this sector. The relevant aspect is that, up to now, the system of traceability had been totally in the hands of the PHC who, through the specification, made it “compulsory” for all the operators who in some way are involved in the supply chain (breeders, slaughterers and producers) to apply it. This particular aspect becomes quite important if you consider that the companies which have joined the Consortium are from the Small/Medium Enterprises category and that the Consortium controls the mark, the famous five-pointed coronet, which guarantees to the consumer the reputation of the product they sell.

It must be recognized that the reputation achieved through the years by the Consorzio del Prosciutto di Parma vis-à-vis consumers is the most important factor ensuring the success of this product, even before their system of inspections, now carried out by the IPQ, became known. However we must not forget that the system of inspections, through which information is collected on the history, use and origin of each pork leg, thus allowing product traceability, is the means for ensuring compliance with the standards established by the specification, for which the IPQ are responsible, vis-à-vis the Consortium and consumers. This traceability, however, stops at the Inspection Authority – now the IPQ - as they hold all the information, which at the moment is not available to distributors nor to consumers.

The proof of the effectiveness of the inspections based on a traceability system, albeit incomplete, is given by the success of this product on the market. The positive image that Parma Ham has achieved through the years with consumers depends largely on the quality level of the ham, maintained even with quite high production volumes (Around 9 million Parma hams were produced in the year 2000, with a total volume of business of 800 meuro). The high quality and reputation have been attained thanks also to the supervisory work of the technical staff of the Consortium and, after that, of the Istituto Parma Qualità.

As we saw, the traceability system used by the PHC, and now by the IPQ, so far has only been an instrument on which the two authorities have based their inspections, but it could become a factor for

further enhancement of the product. This could happen if consumers were made aware of the system, reaching also the last phase of distribution. Unfortunately, after Parma Ham was granted the PDO, producers apparently developed an almost passive attitude towards the initiatives undertaken by the Consortium for the promotion and valorisation of Parma Ham. This behaviour is partly justified by the fact that many companies belong to the Consortium and have delegated their promotional activities to the association. It actually is difficult for small/medium enterprises to carry on brand policies, particularly when there is a strong collective brand.

This tendency to delegate to the Consortium comes up again with traceability, at least in the case of small/medium enterprises, which are the backbone of the sector. The overall picture which emerges from this, shows us a sector characterised by undoubted excellence, due to the high quality of raw materials and adherence to processing regulations and traditional procedures, yet affected, at times, by a lack of communication with the stages downstream of the supply chain, particularly with consumers. This failure concerns not so much the Consortium but rather the individual companies who, at the moment, are not making enough investments to raise awareness of their company brand. (Arfini 2000).

Consumers are still not aware that there is a system of traceability, albeit imperfect, in the supply chain of Parma Ham. For instance, the commercials run by the Consorzio di Parma on television do not “exploit” this inspection instrument, although the advertising message does stress the wholesomeness of the product throughout every phase of the supply chain.

From the point of view of the companies, adopting a “real” system of traceability would enable them to improve the quality of the meat they purchase, because it would allow them to establish direct agreements with breeders. It must be pointed out that the relationships across the pork supply chain are strongly conditioned by slaughterers, who act as a sort of “filter” between breeders and ham producers. To this day, ham producers still have difficulty finding out from which breeder the meat they are processing comes from as the Cumulative Declaration of Conformity does not permit immediate identification of the breeders of provenance, forcing producers to “trust” slaughterers. Procurement, practically at the same conditions for all the ham factories, makes it difficult for individual companies to develop brand policies or to consider diversifying the same collective brand. (e.g. “extra quality” brand).

The companies' difficulty in finding out the provenance of the meat they process was demonstrated by a case study conducted in one ham factory in Parma during the year 2000.

After checking both the Cumulative Declarations and the Homologation document available at the slaughterhouse examined, it was possible to verify that data were consistent, that the required procedures had been complied with and, most importantly, it was possible to trace back to the slaughterhouse and, with some effort, the breeders of origin. In the year considered (2000) the ham factory purchased fresh pork legs to be used for the production of Parma Ham from only 8 slaughterhouses, located mostly in Piedmont (83.5%), Emilia Romagna (11.1%), Marche (4.9%) and Lombardy (0.5%).

The study revealed that the parameters which determine the choice of slaughterhouse are basically: consistent supply quality, price, level of service. The selection of pork legs and meat quality is strongly influenced by the specific needs of the ham producer's customers. It was shown that customers' tastes differ greatly, particularly in terms of fat quantity, texture and flavour (level of saltiness) of the final product. As the result which can be obtained with a pork leg after curing is strongly affected by meat quality, consistency in the quality of supplies will depend also on the breeders, who in turn are connected with the ham factory through the "filter" of the slaughterhouse. The slaughterer can be considered a "bottle neck" in the supply chain and the only player who is in a position to segment quality depending on customers' demands.

From the findings of the study we can observe that while the number of supplying slaughterers is limited, the number of breeders of origin, from which the pigs originated is extremely variable. We can derive from this that the possibility of knowing the identity of the farm of provenance and of origin of the pigs, which could be exploited for marketing purposes, is of no use due to the excessive number of breeders which results in the slaughterers having to perform the necessary function of segmenting goods according to the needs of customers.

## **7. CONCLUSIONS**

The new tendencies of the evolving CAP are characterised by policies valorising PDO-PGI products by means of measures assuring quality, safety and improving their knowledge and reputation.

An example is the action of tracking the pork legs, used to make Parma Ham, possible by means of the system of traceability analysed above.

At this point we are able to answer the question that was asked at the beginning of the paper, that was if the possibility of tracking the pork legs used to make Parma Ham, by adopting the system of traceability analysed above, can be considered as a tool for the evolving Common Agricultural Policy. It can be considered a tool for the evolving CAP because it's important not only to assure the quality standards, required by the Code of Practice, but also to improve the reputation and the competitiveness of Parma Ham. It seems quite clear that being able to trace back to the origin of Parma Ham, i.e. to the breeders, is not important for consumers as they feel safeguarded by the Authorities whose function is to supervise quality.

As far as processing companies are concerned, i.e. slaughterhouses, being able to find out where the pork legs come from could add an indispensable instrument for developing a brand policy. However for the moment slaughterhouses constitute an insurmountable obstacle because they perform the function of "filter" with producers, as they are the only operators who can segment meat quality for their customers.

So it seems that the system of traceability designed by the Consorzio del Prosciutto di Parma and recognised by Regulation 2081/92, is mainly used by the Consortium and by the entire supply chain as it provides an instrument for achieving the new objective of the evolving CAP, assuring the quality standards required by the Code of Practice and, in any case, improving the reputation and the competitiveness of Parma Ham and of every company across the supply chain.

## REFERENCES

- Actia-Actia (1998). *Tracabilité. Guide pratique pour l'agriculture & l'industrie alimentaire*. Paris.
- Akerlof, G.(1970). The Market for 'Lemons': Qualitative Uncertainty and the Market Mechanism. *Quarterly Journal of Economics*, 84, 488-500.
- Anania, G. & Nisticò, R. (1999). Public regulation as a substitute for trust in quality food markets: what if the trust substitute cannot be fully trusted ?. *Proceedings of IAMA Conference*, Firenze.
- Arfini, F. (2000). The value of typical products: the case of Prosciutto di Parma and Parmigiano Reggiano cheese. The Socio-economics of Origin Labeled Products in Agri food Supply Chains and Co-ordination Aspects. *Acts et Communications*, 17, INRA.
- Arrighetti, A. & Seravalli, G. (1998). *Sviluppo economico, convergenza e istituzioni intermedie*. Parma: Working Paper, 8, Facoltà di Economia, Istituto di Scienze Economiche.
- Belletti, G. (2002). Sviluppo rurale e prodotti tipici: reputazioni collettive coordinamento e istituzionalizzazione. In E. Basile & D.Romano (Eds.) *Sviluppo Rurale: Società, Territorio, Impresa*. Milano: Franco Angeli.
- Boccaletti, S. (1992). Il ruolo delle produzioni tipiche e delle denominazioni di origine nella salvaguardia della competitività della produzione agroalimentare italiana. In *Atti del XXIX Convegno di studi SIDEA*. Perugia.

- Bureau, J. C. S. Murette & Schiavina A. (1977). Non-tariff Trade Barriers and Consumers' Information: the Case of EU-US Trade Disputes on Beef. Contributed paper presented at the XXIII IAAE Congress. Sacramento (CA).
- Darby, M. & Karni E. (1973). Free Competition and the Optimal Amount of Fraud. *Journal of Law and Economics*, 16, 67-88.
- Emery, F. (1970). Some Psychological Aspects of Price. In Taylor and B. Willis (Eds.) *Pricing Strategy*. Princeton: Brandon/System Press, 98-111.
- EU Commission (2000). White paper on food safety.
- EU Commission (2002). Communication from the Commission to the Council and the European Parliament – Mid-Term Review of the Common Agricultural Policy.
- Giacomini, C. & Arrighetti, A. (1999). Il sistema locale e l'economia di mercato. Working paper, 34, Università degli studi di Parma.
- Giacomini, C. (1997). Les impacts de la production des fruits et légumes sur l'environnement et réponses en terme de politiques: le cas des résidus de produits phytosanitaires sur les fruits et légumes en Italie. AGR/CA/APM/FV (97)1. Paris: OCDE.
- Gios, G. (1989). La qualità dei prodotti agricoli: considerazioni alla luce di alcune teorie di marketing. *Rivista di economia agraria*, 4.
- Green, R. (2001). *Tracabilità et technologies de l'information*. Projet "Obiettivo rintracciabilità agroalimentare". Parma.
- Klein, B. & Leffler K. (1981). The Role of Market Forces in Assuring Contractual Performance. *Journal of Political Economy*, 81, 615-641.
- Malassis, L. (1973). *Economie agro-alimentaire: Economie de la consommation et de la production agro-alimentaire*. Paris: Cujas Editions.
- Ministero della Sanità, (2000). Controlli ufficiali sui residui di prodotti fitosanitari negli ortofrutticoli. Risultati in Italia per l'anno 1999. Milano.
- Nelson, P. (1970). Information and consumer behaviour. *Journal of political economy*, 78.
- Oliveri, O. (2000). Qualità, la carica dei mille. Agrimese. Marzo.
- Pacciani, A. Belletti, G. & Marescotti, A. (2001). Problemi informativi, qualità e prodotti tipici. Approcci teorici diversi. In R. Fanfani, E. Montesor. & F. Pecci (Eds.), *Il settore agroalimentare in Italia e l'integrazione europea*. Milano: Franco Angeli.
- Shapiro, C. (1983). Premiums for high quality products as a return to reputations. *The Quarterly Journal of Economics*, 97.
- Stiglitz, J.E. (1987). The Causes and Consequence of Dependence of Quality on Price. *Journal of Economic Literature*, xxv marzo.
- Tirole, J. (1988). *The Theory of Industrial Organization*. Cambridge: The MIT Press.
- UNI EN ISO 9001 (2000). Quality management systems – Requirements.
- Valceschini, E. and Nicolas, F. (1995). La dynamique économique de la qualité agro-alimentaire. In F. Nicolas & E. Valceschini (Eds.), *Agro-alimentaire: una économie de la qualité*. Paris: INRA, Economica.

---

\* The work is developed in the framework of the Project of Research of National Importance "The forthcoming WTO negotiations on agriculture and the reform of CAP in European Union" supported by the Italian Minister of Agriculture

\*\*The introduction, the theoretical and legislative framework have been written by Corrado Giacomini. The meaning of traceability has been written by Maria Cecilia Mancini and the Parma Ham study case, prospects and conclusions have been written by Filippo Arfini.