
Regulatory Framework and Private Innovation: The Case of Animal Welfare Friendly Beef Supply Chain in Italy

Filippo Arfini, Maria Cecilia Mancini

Parma University, Italy
filippo@arfini@unipr.it, mariacecilia.mancini@unipr.it

Received 30th September 2009, accepted 15th March 2010, available online 15th April 2010

ABSTRACT

The paper examines innovation in the agrifood sector through an analysis of relationships between public institutions and the private sector. The first part is theoretical and analyses the roles played by public and private actors in innovation. The second part is a case study of the beef supply chain of COOP, the biggest retailer on the Italian market. It exemplifies product innovation driven by a regulatory framework and shows how organisation and structural renewal required by animal welfare legislation can lead to voluntary initiatives and additional innovation along the supply chain. The case study also features the role of institutions in communications and shows how market awareness drives improvement in organisation of production chains.

Keywords: animal welfare, private innovation, regulatory framework

1 Introduction

Increasing “industrialisation” of food production has brought about important changes in process and product, and food products today are increasingly a result of long and complex processing and manipulation of raw materials (Byé, Fonte, 1992). Many factors underlie the industrialisation currently taking place: mainly, resources have been made more productive in order to keep costs down, in response to the requirements of wider markets and higher levels of competition. The need to diversify product attributes is also important; demand is increasingly segmented and consumers now want new ready to serve foods which can also be preserved and stored (Carbone, 2004).

The industrialisation of food production has been supported by technical development which has also led to new management systems in firms and new models in the relationship between private sector and public institutions (PIs). Research and development (R&D) has improved various aspects of company activity, from supply and logistics to communications and promotion of services and products, and made them more answerable to planning requirements.

In the traditional relationship model of R&D, PIs promoted innovation through legislation and incentives or direct investment in Universities or research stations and companies exploited this process. But in the new model, it is producer firms that today are investing human and financial resources in innovation, while the lawmakers protect consumer interests¹. Over the last few years, legislation has intervened to protect consumer health and drawn up a new regulatory framework (RF) to reduce the information asymmetry between producers and consumers, which has pushed firms to adapt management, communication and promotion models. This paper describes the interaction between the RF and private sector innovation in food and assesses the organisational and communication implications for firms and consumers.

¹ Legislation enacted for consumer protection in GM products and functional foods are two examples.

The first part of the paper is a theoretical description of R&D models and their implications for the agrifood sector. The second part presents a case study of organisation and communications strategies of the biggest Italian retailer, COOP Italia, in a meat production chain subject to animal welfare (AW) legislation. The case study shows that although COOP Italia does not provide customer information on product and process innovation, it is conforming to the new legislation and going beyond it and adopting even stricter standards.

2 Innovation as a development factor: Theoretical background

Our examination shows that firms follow different policies on the road to innovation and different types of relationships are formed between firms and PIs. In this framework, PIs mainly have the role of promoting basic research and guiding firms towards vertical or horizontal cooperation. They are particularly important in lowering the cost of private research in the name of private growth and development able to transfer wealth to society. Firms, on the other hand, apply basic research in order to improve production technology but mainly to generate new products and compete on the market more successfully.

R&D is a key factor for creation of value for new products launched on the market and is also a key factor in the level of innovation of a sector and / or firm. It concerns both process and product linked by a mechanism of "action – reaction." These may be separate in other sectors, but in agrifood, process and product are linked because the launch of a new product is often a result of process innovation, and vice versa.

R&D is thus the outcome of activity organised by firms and PIs which generates company innovation processes and promotes the economic and social development of a nation.

R&D can be divided into three distinct phases (Antonelli, 1999; Malerba, 2000): basic research for the increase of scientific knowledge not aimed at obtaining any specific good, applied research aiming at new products and precise production processes, and development in effecting a particular product or process. The three phases follow a sequence, but are often blurred as the importance of each varies between sectors and firms.

Innovation can thus be assimilated into a process of generating a new product or production process which concerns four areas of the firm: research, development, production and marketing (Malerba, 2000). As a firm adopts a new production process with the aim of economic benefit, it is encouraged to invest in research and keep production costs as low as possible. Another aim is to gain advantage over competitors and greater consumer trust, which can be translated into better reputation and willingness to pay for the firm's products. The firm's innovation level is thus viable if R&D yields economic benefit in the form of consumer appreciation for the product and willingness to pay. In this model, the role of the firm is to innovate but also to predict where innovation should be directed, on the advice of its marketing and production departments. It is the firm which learns, introduces new technologies, invests in innovation, coordinates the process internally and externally through different types of agreements, and thus gains profits and growth. Nevertheless, firms differ in terms of technical skills, organisational structure, behaviour and performance.

As firms are not the only social economic actors involved in innovation, PIs usually promote R&D of a country by entrusting basic research to Universities and public research institutes working in different sectors in policy and research. The most widely held view however is still that the firm is the economic subject responsible for production and transforming input into output in order to reach its main aim, usually profit. This leads to the hypothesis that a firm is a rational entity, in that it has available all relevant information for optimising performance (Malerba, 2000). Assets are sometimes invested in R&D in order to influence rival firm's behaviour and competitors' expectations or consumer expectation. It is usually firms which put up barriers against entry and increase market share through innovation and it is firms which are market leaders and force rivals to quit as well as influence consumer behaviour by directing them towards new goods. In other words, it is firms which dictate competitive dynamics and modify markets. This model sees the firm endogenous to market structure (Battaggion, 2000). The model also sees increasing firm know-how as an endogenous process because the capacity to innovate depends directly on firm investment in research. Know-how or technology is not common to all firms; only some firms are able to use it and often only partially. So technology is not freely available and its spread follows different dynamics. This is of course unlike the neoclassical model which saw technical progress as exogenous and technology as a public good.

What incentives are there for investing in research? According to Schumpeter's and Arrow's model, firms in monopoly conditions have no incentive to innovate, while social planners have maximum incentive.

Firms in competitive market conditions lie between these two extremes and follow research policies both cooperatively and non cooperatively (Malerba, 2000). Schumpeter states as a central plank of his analysis that the “pure market” cannot alone give incentive for innovation sufficient to guarantee maximum social well being. In other words, in relatively concentrated markets, there is under investment in research which constitutes a failure on the part of the market to allocate the intangible resources of R&D, a failure which justifies public intervention in incentives for innovation.

In the context of a competitive market, firms may develop alternative and complex approaches covering all organisations involved in innovation: firms, Universities and research institutions, financial institutes and the Government. The efficacy of interaction between these various organisations affects the effectiveness of development itself. There are two types of interaction: “Principal-Agent,” or vertical interaction between client and supplier, (Tirole, 1991; Salanié, 1994; Allain, Chambolle, 2003) and cooperative horizontal interaction (Montobbio, 2000).

Vertical or “Principal-Agent” interaction sees technical progress as a cumulative process of knowledge transfer. The solution of technical problems and mechanisms for creating new products are linked to level of knowledge of firms in the sector. Learning is often interactive and is one of the ways firms introduce innovation into process and product, and organise knowledge internally. In this model, a firm wishing to introduce new processes or products, in order to overcome uncertainty or limited information, finds it advantageous to develop stable relationships with suppliers. This triggers interactive learning and allows the transfer of knowledge and skills and optimisation of the production structure. Stable relationships allow common codes of communication and personal and informal networks which facilitate both upwards and downwards learning (Lundwall, 1992; Malerba, 1992). As well as reducing uncertainty, this lowers transaction costs. The more complex the system, the greater the advantages for firms as levels of information become less asymmetric and opportunistic behaviour becomes less likely.

This model occurs mainly where voluntary or contractual networks of firms exist or where clients’ requirements encourage suppliers to make specific innovations.

The second type of interaction between firms is horizontal and subject to firms’ desire and capacity to cooperate². Institutional aspects are secondary in influencing collaborative mechanisms and their impact on technological change, but they are important in bringing down research and patent costs (Freeman, 1987).

The two models (vertical and horizontal) show a variety of routes that firms and PIs can take to develop R&D. These mechanisms are followed in the agrifood sector, where there is both vertical and horizontal interaction, and PIs in fact play a key role in basic research and bringing down costs.

More recent literature has described an R&D model oriented to the presentation of new products aimed at meeting consumer requirements. The New Product Development (NPD) model (Van Trijp, Steenkamp, 2001) sees consumer requirements as the starting point for the NPD process (primary demand) and product and production technology as the consequence (Figure 1).

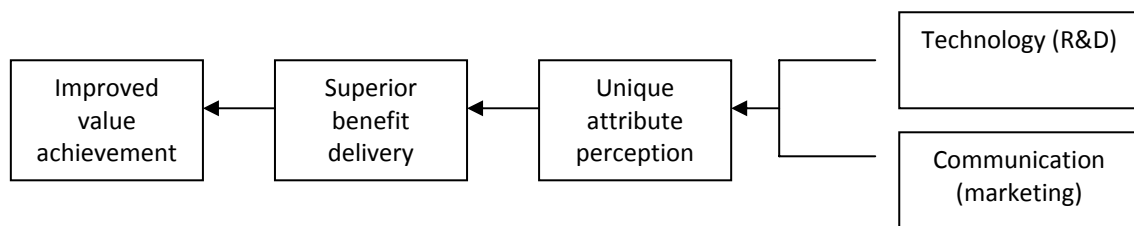


Figure 1.
New product development
 Source: Van Trijp and Steenkamp (2001)

The left hand side of NPD model represents the consumers’ reasons for product consumption. This reflects a thought basic to the New Consumer Theory, that consumers do not value products per se, but rather the benefits that these products provide upon consumption (Audenaert & Steenkamp, 1997). The new product is a bundle of concrete attributes offered by the company as a vehicle for superior benefit delivery. Perceptions of these attributes may be delivered through better product technology as well

² In today’s context of ITC and telecommunications, R&D organised internationally is particularly favoured by multinationals which have access to research findings in other countries, as they can invest directly overseas or make agreements for technological cooperation (Montobbio, 2000).

better marketing efforts (Hauser, Simmie, 1981). Superiority of a new product is encapsulated in the Core Benefit Proposition, the central benefit or purpose for which a consumer buys a product, which makes it superior to competition (Urban, Hauser, 1993). The Core Benefit Proposition is the keystone of marketing and the vision underlying a new product; it reflects cooperation between various functions within the firm: consumer research, R&D, design and production and marketing.

In the agrifood system, however, R&D is mainly oriented to lowering production and process costs and improving preservation of food. There is an increasingly important service content (Fanfani, 2009).

3 A new role for PIs in the food sector?

National Governments and the EU need to ensure that technologically innovative products do not pose a risk to consumers, so in the food sector, PI policy is to ensure that companies adopt fair trading standards. The particular concern is food safety and transparency of the system as well as ethical considerations as required by a certain market segment.

Recent rapid technological innovation in the food sector has in fact increased the level of risk to consumers³ and PIs now implement policies to limit this. An important example is the European Food Safety Authority (EFSA) which now monitors the sector and provides law making bodies with food safety information aiming to ensure that consumers receive transparent and truthful information⁴.

Conformity with food legislation may superficially appear to hinder innovation but in reality it creates the conditions to enhance product quality and can thus constitute a stimulus. PIs introduce norms which are, de facto, a sort of exogenous driver of innovation for producers (Earle, Earle, 1997; Meulenbergh, 1997). Not all producers, however, are willing or able to adapt to the new RF and take advantage of it, and a self selection process divides them into three categories: (a) companies not able to comply with regulations which thus lose their licence to produce, (b) companies complying with regulations and (c) companies going beyond compliance with regulations which develop a marketing strategy based on their efforts to 'overtake' regulations and thus create end value (Arfini, Cernicchiaro et al., 2006).

PIs may thus adopt strategies which encourage firms to pro actively adapt processes and products. This was the case when the EU created the framework for the marketing and development of credence goods. The objective was to provide consumer guarantees on product features like origin (PDO, PGI) production methods (organic products) or ethical aspects (e.g. AW). The RF thus defined certification schemes, which are followed and paid for by firms wishing to enter a new market segment. In this way, PIs carry out their role of consumer protection through quality labels or publicity for credence attributes. The more complex and not tangible the attributes are the greater investment is needed in communications (Lassaut & Sylvander, 1998).

It is important to note that the success of innovation, introduced by PIs or otherwise, is often a reflection of the firm or institution's capacity to inform consumers of product characteristics and its benefits. That is why spending on publicity is included in the innovation process (Gregori, Garlatti, 1997; Ward, 1997) and can determine failure or success. The firm's use of innovation as a marketing instrument depends whether it has an interest in making known the innovative characteristics of the product. For credence goods, the main determinant of firm behaviour in promotion is the economic advantage. This is obtained if profits from sales of credence goods (CG) are higher than the costs of organising the process and communication and promotion costs (1).

$$(1) \quad \text{Profit}_{CG} \geq \text{Supply Organization Cost}_{CG} + \text{Communication and Promotion Cost}_{CG}$$

The costs of production and managing the supply chain are born entirely by firms but the costs of communications and promotions can be considered mixed. They may be born by firms developing brands or own labels, and / or by publicly funded associations or consortia (Gregori, 1997). Clearly, the more intangible and transversal the content to be communicated, the smaller incentive firms have to invest, which is the case of credence good producers. There are however two different types of credence good. In some cases, the consumer is distant from values expressed through the good and, as publicity costs are high, firms have no incentive to invest and the success of a product strongly depends on the PI intervention. But in other cases, the consumer is closer to the values expressed in credence attributes,

³ Production and sale of gamma ray treated products, preserving agents, GM products, heat treated cooked and frozen products are examples of innovations which might pose health risks.

⁴ H.A.C.C.P., beef traceability, global traceability, GM labelling and rules limiting nutritional claims are examples of EU consumer protection.

the potential market is greater and there is greater awareness of the message so that firms show more interest in investing in advertising. They are also more likely to create or invent new products in order to add value to their brand and enhance their reputation (Treager, 2003). They may also place restrictions on their supply chain which are tighter and offer better guarantees on credence attributes than those actually required by legislation.

4 Empirical evidence on animal welfare strategies in Italy⁵

A series of food scares, particularly BSE, seriously damaged the trust between citizens and food safety institutions, and only very decisive Government intervention has been able to repair it, at least partially. The EU has revised and reorganised food safety legislation and placed new obligations on the sector. Examples are Reg. (CE) 1760/2000 on beef traceability and Reg. (CE) 178/2002 extending these obligations to all chains. The EU also set up the European Food Safety Authority (EFSA) to provide scientific advice on food safety.

An example of product innovation driven by this RF is COOP, the most important retailer on the Italian market. It has 163 separate cooperatives, 1265 retail points with an overall surface area of 131.900 square metres and more than 52.000 employees. The sales network consists of supermarkets and hypermarkets.

100% of beef sold in the stores is under the “COOP” label and is sourced from the COOP controlled branded supply-chains. This chain has been reorganised on the basis of regulations in force as well as additional non legally binding AW guidelines. The aim is to ensure high product quality, especially as regards health and hygiene, and to consolidate the ethical aspect of the COOP mission. The ethical approach of COOP is an important aspect in the creation of the enterprise’s global value. COOP is, in fact, SA 8000 certified and its suppliers sign an ethical code of conduct so that trading relations meet standards of transparency and collaborative management as well as ethical criteria in all operational phases.

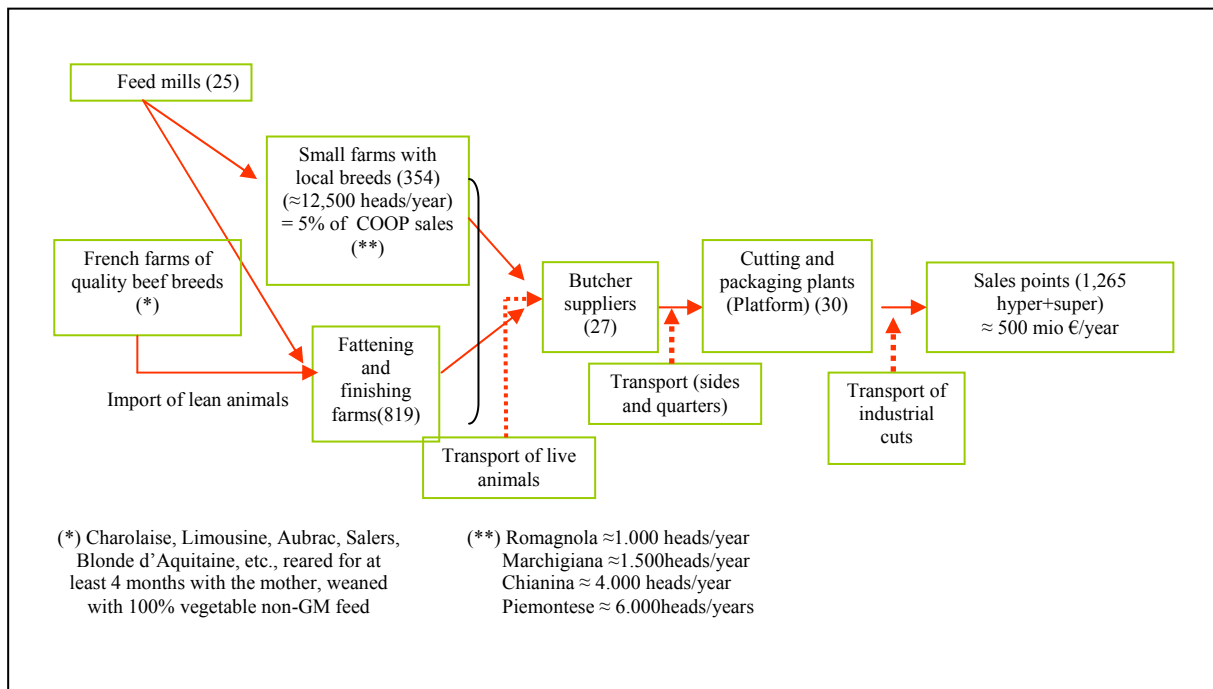


Figure 2.
 The COOP beef chain in figures
 Source: Elaborations of the authors

⁵ These findings were made as part of the Welfare Quality research project co-financed by the European Commission, 6th Framework Programme, contract No. FOOD-CT-2004-506508. The text represents the authors’ views and does not necessarily represent a position of the Commission, which is not liable for the use made of such information.

Meat is supplied only by farms on the COOP list of approved suppliers. They are selected on the basis of farming methods which have to meet animal welfare, environmental and hygiene standards. They are assessed at entry through the documentary evidence and initial inspections are carried out. They are also monitored during supply through regular supervision and inspections. Wholesalers importing beef from France sign contracts in which they undertake to purchase from certified farmers and to sell only animals that comply with the COOP specifications, including traceability requirements, and to retain sales records for at least 2 years. Audits and inspections by COOP and CSQA⁶ are carried out at all points on the COOP chain: feed mills, farms, slaughterhouses, suppliers, platforms, transporters, sales points. The chain controls include more than 310,000 heads/year, for 1.4 million €/year (Figure 2).

As well as the code of practice, COOP also activates a relationship with farmers which aims to improve their technical capacity, developing their skills according to market needs.

COOP is thus an example of vertical innovation. The benefits of new breeding techniques and management innovation are passed along the chain in order to guarantee the quality of the meat and supply consumers with a product that meets their expectations. Its strategy for farmers is multidisciplinary and includes requirements on farm management (environmental requirements, check lists on farm management and attention to production costs) and beef production such as quality, safety and application of AW standards. And in collaboration with Universities and public research centres, COOP also finances research projects which aim to identify and assess parameters of AW that can be applied to Italian beef production.

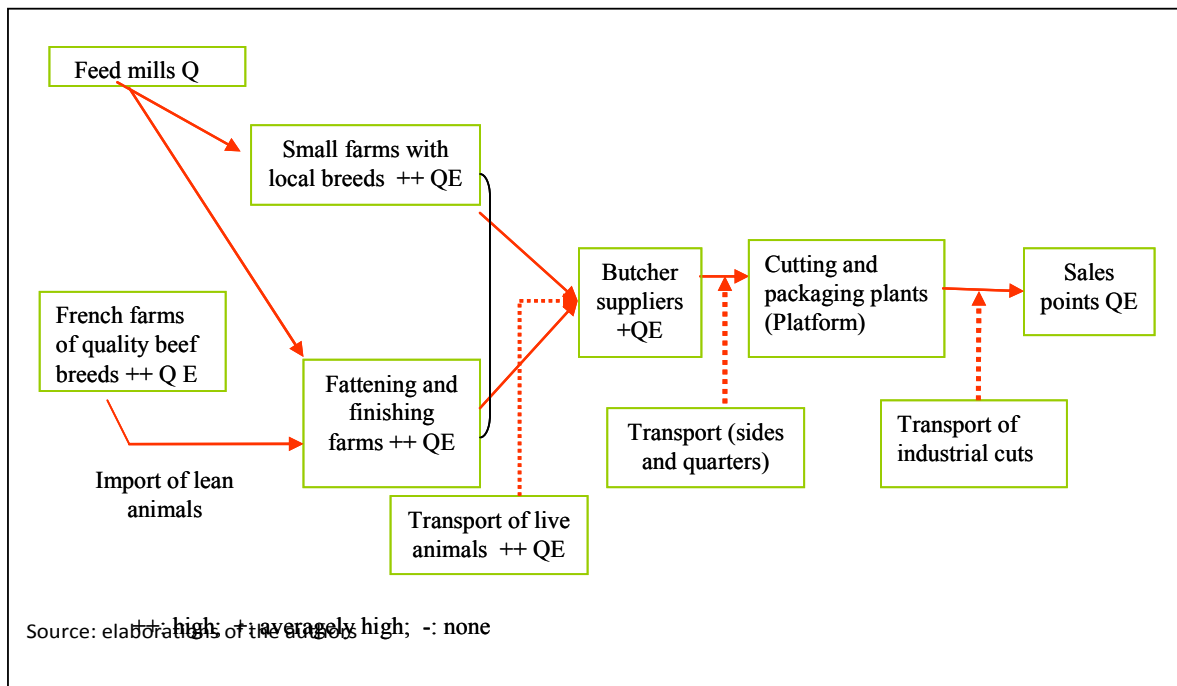


Figure 3.

COOP beef chain: level of attention paid to animal welfare during operations as ethical component and tool for quality

COOP structural and management procedures and AW requirements for suppliers are shown in Figure 3 and Table 1. The COOP production protocols pay close attention to AW on farms, with particular attention to feed, hygiene and the health and psychological conditions of the animals, as well as the transport and slaughtering conditions. COOP policy on the welfare of productive animals can thus be summed up in the words Quality (Q) and Ethics (E).

The important role of AW in COOP beef production all along the supply chain is geared at safeguarding the consumer from the potential risks of uncontrolled production aiming only at the largest possible quantities.

But despite its commitment to improving AW standards in the beef chain, COOP has not developed publicity or a “branding policy” reflecting AW. There are several reasons for this.

⁶ CSQA is an Italian certification body.

Table 1.
COOP AW requirements for suppliers
 Source: Elaborations of the authors

Actors of the food chain	Requirements.
Feed mills	"No GM" feed chains, no animal flour and no added animal fats.
Farms	<ul style="list-style-type: none"> • multiple stalls; • health and hygiene conditions of the animals and the environment; • feed: rations suited to the various farming phases according to weight and age; • adoption of natural farming methods.
Transport and slaughtering	<ul style="list-style-type: none"> • animals slaughtered at less than 22 months; • avoid stress for the animals.
Sales points	The meat for sale comes exclusively from predefined suppliers/farms.

The first is that identifying just one product line as AW friendly would automatically show other lines in a poor light and discriminate against them as not respecting AW. The second is that COOP judges the Italian consumer to be unready to accept products with this attribute. And in the absence of a public AW promotion strategy at national level, COOP believes that specific information on AW is not sufficient to stimulate sales and that supplying information only on AW is too expensive. It is just one important issue in selecting and strengthening the supply chain, the others being qualifying and keeping loyal suppliers and farmers, know-how transfer, product enhancement and customer loyalty. Investment in promotion is therefore made where AW is one of a larger set of quality requisites. This makes it more cost effective.

In our case study, the retailer started from organisational and structural renewal imposed by legislation and went on to take voluntary initiative and stimulate further innovation in the supply chain. But in assessing the relationship between RF and innovation in the private sector, it is important to note that COOP opted not to keep consumers informed of its commitment to AW techniques. And given that COOP, the largest retailer in Italy, made this decision, it is unlikely that food processors in general will have the resources to make this investment, particularly the SMEs which constitute most producers in Italy. Public commitment to consumer information is therefore essential for there to be a virtuous cycle of innovation and development between the RF and private sector intervention. Only when the end market is aware and properly informed can it reward credence goods through higher consumer willingness to spend.

5. Conclusions

The process of innovation in the food sector is generating new production processes and making available products containing higher levels of customer service as well as enriching the market with credence goods. RF plays a key role in guiding innovation in the private sector, as legislation encourages firms to produce goods with new quality attributes such as AW friendly products.

In our case study, legal provisions enacted with the aim of introducing food safety and ethical considerations into a long and complex production cycle have become an opportunity for innovation and, in some conditions, may become factors in competitiveness. But we also found that competitiveness depends on the involvement of the end market which shows willingness to pay for credence attributes only if there is a sufficient level of awareness.

Our case study shows that, although AW products are available on the Italian market through a virtuous cycle of interaction between public and private initiative, no promotional investment is made mainly because consumers are not currently aware of the ethical aspects of AW. Although individual firms are innovative, they mainly find it too costly to raise consumer awareness and tend to include AW product characteristics in the set of quality variables.

Public intervention on credence goods is thus not fully efficacious if it has no component of public information. The case of COOP Italia shows that ethical and health aware production techniques need to be accompanied by public promotion which pushes consumers to choose these products, thus completing the virtuous cycle of public intervention and private enterprise.

References

- Allain, M.L., Chambolle, C. (2003). Approches théoriques des rapports de force entre producteurs et distributeurs. *Economie Rurale*, n. 277/278, Septembre-Décembre.
- Antonelli, C. (1999). *Elementi di economia dell'innovazione*. Torino, Theleme.
- Arfini, F., Cernicchiaro, S., Mancini, M.C. (2006). Animal welfare in the CAP and large scale distribution. Public social policy and consumer trust. In Fritz, M., Rickert, U., Schiefer, G. (Eds.), *Trust and Risk in Business Networks*(pp 449-458). Bonn, Universität Bonn- ILB.
- Audenaert, A., Steenkamp, J.B.E.M. (1997). Means-end theory and laddering in agricultural marketing research. In Wierenga, B., Van Tilburg, A., Grunert, K., Steenkamp, J.B.E.M., Wedel, M., (Eds.), *Agricultural marketing and Consumer Behaviour in a Changing World*. Boston Kluwer Academic Publisher.
- Battagion, M.R. (2000). Modelli neoclassici di R&S, strategia di impresa e struttura di mercato. In Malerba, F. (Ed.), *Economia dell'innovazione* (pp 53-81). Roma, Carrocci Editore.
- Byé, P., Fonte, M. (1992). Verso tecniche agricole fondate sulla scienza. *La Questione Agraria*, 48: (pp 43-65).
- Carbone, A. (2004). Salubrità e qualità nell'agricoltura multifunzionale dell'Unione Europea. In Henke, R. (Ed.), *Verso il riconoscimento di un'agricoltura multifunzionale. Teorie, politiche, strumenti* (pp 256-259). Napoli, INEA, Edizioni Scientifiche Italiane.
- Earle, M.D., Earle, R. (1997). Food Industry research and development. In Wallace, L.T., Schoroder, W.R. (Eds), *Government and the Food Industry: Economic and Political effects of Conflict and Cooperation* (pp 125-140). London, Kluwer Academic Publishers.
- Fanfani, R. (2009). *Il sistema agroalimentare in Italia*. Milano, Edagricole.
- Freeman, C. (1987). *Technology policy and Economic Performance: lesson from Japan*. London, F. Pinter.
- Gregori, M., Garlatti, S. (1997). Il marketing collettivo dei prodotti agroalimentari. Udine, Università degli studi di Udine, FORUM.
- Hauser, J.R., Simmie, P. (1981). Profit maximization perceptual positioning: an integrated theory for the selection of product feature and price. *Management Science*. 27 (1): (pp 33-56).
- Lassaut, B., Sylvander, B. (1998). Producers consumers relationship in typical products supply chains: where are the theoretical differences with standard products? In Arfini, F., Mora, C. (Eds.), *Typical and traditional products: rural effect and agroindustrial problems* (pp 239-255). Parma, Parma University Press.
- Lundvall, B.A. (1992). (Ed.), *National system of innovation. Towards a theory of innovation and interactive learning*. London, F. Pinter.
- Malerba, F. (1992). Learning and incremental technical change. *Economic Journal*, 102: (pp 845-859).
- Meulenberg, M.T.G. (1997). Evolution of agricultural marketing institutions, a channel approach. In Wierenga, B., Van Tilburg, A., Grunert, K., Steenkamp, J.B.E.M., Wedel, M., (Eds), *Agricultural Marketing and Consumer Behaviour in a Changing World* (pp 95-108). Boston, Kluwer Academic Publisher.
- Montobbio, F. (2000). Istituzioni e attività innovativa: i sistemi innovativi. In Malerba, F. (Ed.). *Economia dell'innovazione* (pp 375-404). Carrocci Editore, Roma.
- Salanié, B. (1994). *Théorie des contracts*. Paris, Economica.
- Tirole, J. (1991). *Teoria dell'organizzazione industriale, Teoria dell'impresa. Analisi teorica dei mercati: monopolio, oligopolio e concorrenza. Interazione strategica e teoria dei giochi*. Milano, Hoepli.
- Tregear, A. (2003). From Stilton to Vimto: Using the Food History to Rethink Typical Products. *Rural Development, Sociologia Ruralis* 43:2: (pp 91-107).
- Urban, G.L., Hauser, J.R. (1993). *Design and Marketing of New Products*. Englewood Cliffs, Prentice Hall.
- Van Trijp, J.C.M., Steenkamp, J.E.B.M. (2001). Consumer oriented new product development: principles and practice. In Jongen, W.M.F., Meulenberg, M.T.G. (Eds), *Innovation of Food Production Systems: Production Quality and Consumers Acceptance* (pp 37-66). Wageningen Pers, Wageningen.
- Ward, R.W. (1997). Advertising and Promotion. In Padberg, D.I., Riston, C., Albisu, L.M. (Eds), *Agrofood Marketing* (pp 319-350), CAB International, Wallingford Oxon (UK).