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## **Hypotheses for re-launch of the pig farming sector of Piedmont: medium heavy swine as raw material for feeding the speck supply chain**

**Abstract.** As a part of the strategies identified during the Estates General of livestock farming, the Region of Piedmont has financed a project in order to verify the level of appreciation of medium heavy swine in the swine sector. The Region has involved the Department of Commodity Science of Turin University and APS Piemonte (pig farmers association) in carrying out a specified study [Aceto et al. 2011; Peira et al. 2011]. The results of the study intended to investigate the speck supply chain are set forth below.

**Key words:** medium heavy swine, breeding of swine, Piedmont, supply chain, speck

### **Introduction**

The Italian agro-food system has been only marginally affected by the recent economic crisis and, while other traditional production sectors continue to bear the brunt of the economic situation, it shows signs of renewed growth both in terms of production volumes and production turnover. In this context, the pig farming sector is apparently affected by an inversion of trend, also compared with other livestock production sectors. According to ISTAT (National Statistics Institute) data, the Italian pig farming production remained more or less unchanged in 2010, with a production of 12,948,000 head. In recent decades, sector policy has been predominantly directed towards the production of heavy swine used in Italian quality salami products according to the rules of the EC Regulation no. 510/2006. However, the increase in certified swine production has not been accompanied by a suitable upswing in the consumption of PDO (Protected Designation of Origin) and PGI (Protected Geographical Indication) salami, generating a consequent structural imbalance of the market.

The pig farming sector in Piedmont (the second in Italy as regards the pig headcount) has also been impacted by the above recession phenomena: the overly strong link with the

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extra-regional PDO supply chains is confirmed by the fact that 88% of production is directed towards the Parma PDO Raw Ham or San Daniele PDO Ham supply chains [Peira et al. 2010, pp. 733-738].

Furthermore, an increase in production costs in recent years has gradually eroded profit margins for the pig farmers. According to the data furnished by the CRPA (Animal Production Research Centre), pig farmers' production costs exceed EUR 1.30 per kilogram produced, while market prices fluctuate between EUR 1.22 and EUR 1.28 per kilogram [Bernardelli 2010]. According to sector surveys carried out by the ANAS (National Association of Pig Farmers), the upswing in costs has been driven mainly by increases in cost of animal feed: an analysis of the data of certain raw materials prices in 2010 reveals that the average price of maize has increased by 29% in relation to 2009, the average price of barley by 22.9% and that of wheat bran by 27.9%. Overall, the cost of a standard ration for pigs has increased by around 18%.

In 2008, an livestock supply chain review created by the Ministry of Agricultural, Food and Forestry Policies with all sector stakeholders, resulted in the signing of a Memorandum of Understanding between organizations of various categories in the presence of the Regions in order to identify the strategies to be adopted to recover and create value added for the pig farming supply chain [Crisi... 2008]. According to indications obtained at the national level, the Region of Piedmont has financed a two-year project (2010/2012) to verify the level of appreciation of the medium heavy swine by the operators of various supply chains (cooked ham, speck, fresh meat), also involving the Department of Commodity Science of the University of Turin and APS Piemonte (organization of pig farmers in Piedmont) in its implementation. The results of the study intended to investigate the speck supply chain are outlined below.

## **Speck production in Italy**

All over Italy, the term "speck" identifies a type of salami characterised by a strong link with the territory of the Eastern Alps (Alto Adige, Trentino, Friuli Venezia Giulia, Veneto). It is made from the hind leg of a pig which is boned and trimmed and then salted and flavoured with spices and herbs, smoked, dried and left to mature. The times and methods of the individual phases may vary according to production zone and the type of speck to be obtained. The main types of speck produced in Italy with their related characteristics are set forth in Table 1.

In the Italian salami sector, the speck supply chain is sixth for production turnover and eighth as regards quantities produced. In 2009, total turnover of the salami sector amounted to EUR 7,601 million of which 3.6% relating to the speck supply chain; total salami production amounted to 1,174,400 tonnes of which 2.37% relating to the production of speck (Table 2).

In the last four years, the speck sector has remained more or less stable as regards quantity of finished product, with production fluctuating between a maximum of 28,000 tonnes (in 2007) and a minimum of 27,800 tonnes (in 2006, 2008 and 2009). In the period 2005-2008, there was a modest 5.79% increase in the sector's production turnover, which moved to EUR 274 million, also confirmed in 2009.

Table 1. Main characteristics of speck produced in Italy

Type of speck	Zone	Raw material	Salting	Smoking	Curing
Speck Alto Adige PGI	Province of Bolzano	thigh	salt, spices duration: N/A	non-resinous wood temp.: max 20°C duration: 3 weeks	temp.: 10-15°C humidity: 60-75% duration: min. 20-24 weeks
Speck Trentino	Province of Trento	thigh	salt, spices duration: min 3 weeks	wood temp.: 22°C duration: 2-3 weeks	temp.: 12-16°C humidity: N/A duration: 12-24 weeks
Speck of Carnia and Sauris	Friuli Venezia Giulia	thigh	salt (and spices) duration: 2 weeks	wood temp.: N/A duration: min. 1 weeks	temp.: N/A humidity: N/A duration: min 8-14 weeks
Speck of the Cadore	Province of Belluno	thigh	salt, spices duration: N/A	non-resinous wood temp.: max 20°C duration: N/A	temp.: max 15°C humidity: 60-90% duration: 20-22 weeks

Notes: N/A – Not Available.

Source: own research.

Table 2. Production, turnover and quantities of salami produced in Italy in the period 2006-2009

Product	Salami production, thousand tonne/year				Production turnover, EUR million/year			
	2006	2007	2008	2009	2006	2007	2008	2009
Raw ham	278.1	283.1	280.1	280.6	1,943	1,997	2,011	2,015
Cooked ham	281.2	283.7	277.3	275.8	1,796	1,830	1,839	1,830
Mortadella	171.5	172	171.8	173.9	655	653	663	670
Salame	108.9	110.1	109.8	110.4	903	906	917	921
Coppa	43.5	43.7	43.4	43.5	306	303	307	308
Speck	27.8	28	27.8	27.8	269	271	274	274
Bresaola	16.9	17.1	15.9	15.7	227	232	238	234
Wurstel	52.4	52.9	52.3	53	239	238	241	243
Pancetta	58.1	59.9	62.3	63.9	204	213	222	228
Other salami	123.3	126.3	127.8	129.9	837	861	866	878
TOTAL	1,161.7	1,176.8	1,168.6	1,174.4	7,379	7,504	7,578	7,601

Source: [ISTAT data processed... 2011].

Speck production can be divided into PGI-certified production and uncertified production. The production of Alto Adige PGI Speck accounts for 35.3% (2009) of the sector's total production. Due to particular market conditions, in 2008, this share rose to 40.4%, with 11,224 tonnes of certified product out of a total production of 27,800 tonnes (Figure 1). According to the data of the 2010 Qualivita Annual Report, the branded product recorded a production turnover of EUR 112.2 million in 2008, which dropped to EUR 88 million in 2009. Consumer sales topped EUR 202 million in 2008, dropping to EUR 180 million in 2009.



Fig. 1. National production and PGI production in the period 2006-2009

Source: statistical data [ISTAT data processed... 2011; Qualivita... 2011] processed by the authors.

## Materials and methods

With regard, in particular, to the speck supply chain, the Department of Commodity Science of Turin University carried out in the first year of activity of the project a survey of Italian speck producers. According to indications obtained from APS Piemonte and various supply chain operators, the survey was based on a questionnaire drawn up and subsequently administered to the main sector operators.

The questionnaire was divided into three parts consisting of a total of 24 questions. The first part of the survey was directed towards gathering information regarding sourcing of the raw materials and finished product destination markets. Indicators were requested such as the number of thighs purchased per week, their origin, sourcing channels, the criteria adopted by the companies to select their suppliers, destination markets.

The second part investigated aspects tied to possible product characterisation instruments in order, in particular, to highlight the advisability of obtaining various certifications, such as Italian origin, the absence of MGO, supply chain traceability, animal wellbeing, biological production, energy efficiency and the International Food Standard and/or the British Retail Consortium. If interested, the interviewee was asked, for each certification, to indicate the highest costs considered sustainable for obtaining this instrument of valorisation.

The third part focussed on possible peculiar aspects of the raw material (top fat, piece size, marbling, colour of the meat and fat) obtained from medium heavy swine. The questions ended with a request to define possible interest in predetermination of the purchase price of the raw material for defined periods of time and willingness to purchase the raw material obtained from medium heavy swine.

The questionnaire was administered (from April 2010 to September 2010) through personal PAPI (Paper and Pencil Interview) type interviews of the person identified, with compilation by the interviewer, according to the interviewee's answers, or by the

interviewee. The data were loaded and processed using the SPSS (Statistical Package for Social Science) PASW Statistics 18. The questions forming the questionnaire were transformed into 76 variables.

## Discussion

The sample comprised 62 companies and 42 of these participated in the research. The interviewed speck producing companies are located in the Provinces of Trento (18), Bolzano (13), Udine (5), Belluno (4), Aosta (1) and Pordenone (1) (Figure 2).

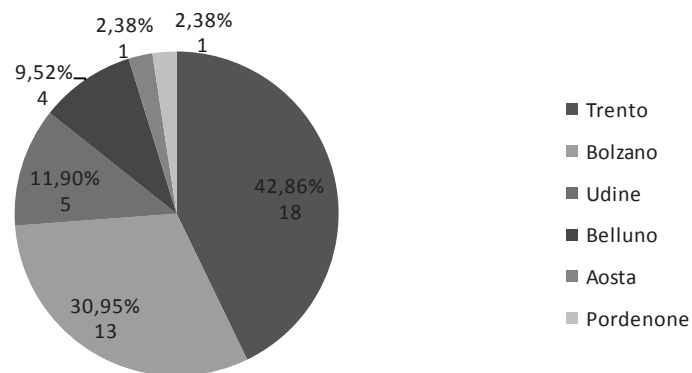


Fig. 2. Breakdown of companies interviewed by province, the number of companies and their percentage  
Source: own research.

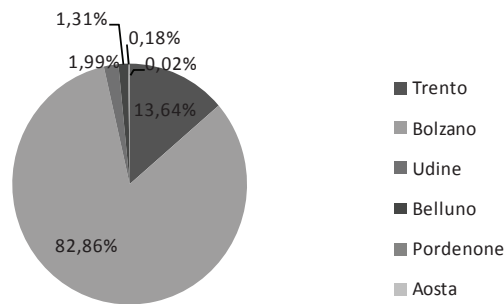
The information gathered revealed that speck producers use different types of raw material in their production process: thighs, baffas (large portions), quarters and also half carcasses and whole pigs.

The baffa (a traditional cut of the thigh used in the production of speck) is a preferred anatomical cut of by speck producers as it is ready for processing (58.49%). Although they require an additional phase for preparation, thighs represent more than 30% of the procurement of raw material. The quarters, half carcasses and whole pigs account for just over 10% of a total. It was also observed that the highest demand for raw material for the production of speck comes from companies located in the Province of Bolzano: declared weekly procurement is equal to 82.86% (91,825 units) of the total identified. Speck producers in the Province of Trento declared a demand for raw material equal to 13.64% of the total (15,116). The Provinces of Udine, Belluno, Pordenone and Aosta have a share of 3.5% (Figure 3).

The sample companies interviewed declared that they processed an average of around 111,000 baffas each week. Assuming a constant production for the entire year (52 weeks), the companies that participated in the survey represent a production of almost 5.8 million speck/year.

It must be remembered that the first 5 companies cover around 81% of the total production declared, certainly not an irrelevant figure when referring to adoption of

certifications: in fact, these 5 companies will be decisive in any product support strategy. Considering the 6 companies that declare a weekly production of between 1,000 and 4,999 baffas, it can be deduced that the first 11 companies cover 93.15% of the total production indicated. The replies also reveal that most of the companies are small size: 21 companies out of a total of 42 produce less than 499 baffas per week. Out of the 21 small companies, 16 produce less than 200 baffas per week, thus highlighting the mainly artisanal character of most of the producers interviewed (38%).



Notes: \*\*Units of raw material\* indicates the number of thighs, quarters, *baffas* or half carcasses used for production of a speck; whole pigs are considered as 2 half carcasses.

Figure 3. Procurement of units of raw material\* by Province, %.

Source: own research

The origin of the raw material is assessed on the basis of number of product units utilised to produce speck. The main procurement market is Germany which furnishes 62,428 units of raw material (57.9%). Holland (17.9%), Austria (12.1%) and Denmark (9.7%) are the other procurement markets of baffas, quarters, thighs. The Italian raw material (2.2% of the total) is requested mainly by operators in the Province of Trento who are particularly attentive to this issue: the 10 producers who declare that they use Italian raw material absorb 77% of the total (1,780 units). Preference is given to the internal procurement market as the Italian raw material has superior organoleptic-sensorial characteristics compared with that of North-European swine: some of the operators supply their production with Italian raw material while others use this to supply minor niche productions.

The specific characteristics of the product are the main reason for selecting suppliers (32 preferences). Standardisation of the raw material (22), i.e. raw material with constant characteristics also in different procurement lots, in order to guarantee the same quality and a constant production process and suitable preparation (18) for processing complete the selection criteria preferred by producers. Factors such as service and price play a secondary role, confirming most operators' need to give priority to characteristics regarding the intrinsic quality of the raw material.

Slaughterhouses (23 preferences) and butchering laboratories (16) are the preferred procurement channels of speck producers. The raw material is also obtained through

wholesalers (7), sales agents (4) and producer cooperatives (3). A number of medium-small companies indicated direct purchase from breeders as their preferred channel (5).

The main destination market for speck is Italy (81.3%). Germany (14.9%) and Austria (2.9%) absorb around one fifth of production. A minimum part is exported to Japan (0.56%): the companies with Japanese customers declare that they purchase the raw material in Holland as this guarantees a certification required by Japanese importers in order to comply with strict food safety regulations (Figure 4).

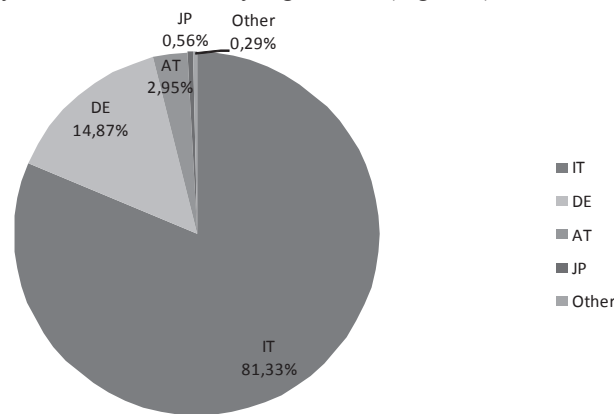


Figure 4. Speck production by destination market, %

Source: own research.

With regard to possible product characterisation instruments, the certified Italian raw material seems to be particularly appreciated by speck producers. The companies also declare that they are equally favourable to supply chain traceability certification (ISO 22005) and to possible coding of animal wellbeing. These requirements derive directly from the demands of consumers, increasingly attentive to the country of origin of agro-food products and also to aspects concerning livestock health and wellbeing.

The companies interviewed also demonstrated an evident interest in certification for the use of non-GMO animal feed, which was also confirmed by most consumers (50.41%). Both companies and consumers share the same opinion of UNI EN 16001 certifications and biological production, which are not particularly appreciated.

Most of the companies that expressed a particular interest in certification of origin and traceability are willing to sustain a higher cost for procurement of raw material. While demonstrating a different level of interest for other certifications, the companies were not particularly interested in acknowledging a higher value of the material with certificate (Figure 5).

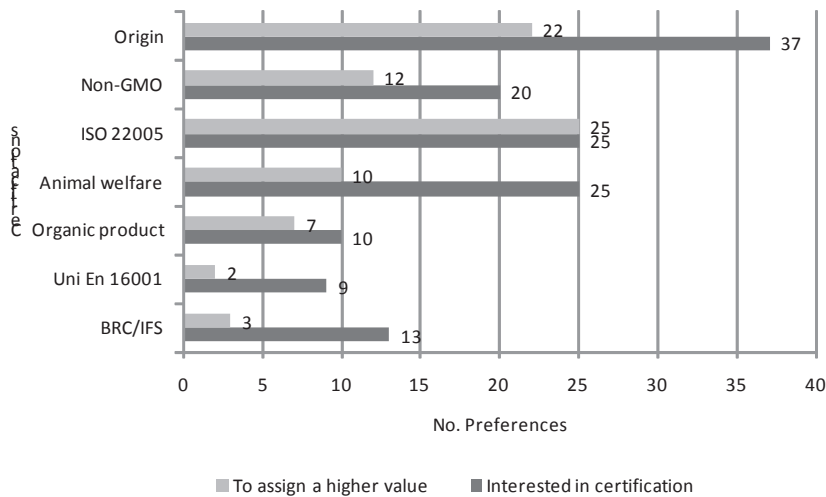


Figure 5. Number of companies interested in certification and willing to assign a higher value to certified material, by type of certification

Source: own research.

In order to assess the compatibility of medium heavy swine with the production of speck, the companies in the sample were asked to indicate the optimal characteristics of the raw material. According to their replies, it is possible to reconstruct a hypothetical model of baffa from medium heavy swine for the production of speck.

Table 3. Ideal characteristics of the raw material obtainable from a medium heavy swine

Characteristics	Preferred option	No. of preferences
Thickness of top fat, cm	1 - 1,50	18
Size of baffa, kg/piece	≤ 9	15
Marbling of baffa	discrete	16
Colour of baffa	bright red	25
Colour of fat	pinkish white	19

Source: own research

Considering the highest number of preferences as discriminant for identification of an optimal baffa, it can be considered with a good level of approximation that the raw material that complies most closely with speck producers' requirements is that with thickness of top fat between 1.0 and 1.5 cm, weight per piece of not more than 9 kg, discrete marbling and a bright red colour. The optimal colour of the fat after curing should be white with pink veins (Table 3).

The 42 companies interviewed demonstrate a certain interest in predetermination of the purchase price of the raw material: 11 would be favourable for a period of 6 months, 6 for 3 months and 5 for only 1 month (total of 52.4%); 11 companies declare they are not interested (26.2%), while 9 companies did not answer.



Lastly, 43% of the operators interviewed (18 companies) are willing to purchase the raw material obtained from medium heavy swine without any constraint; 17% (7 companies) declare their willingness but at particular conditions: 6 companies are interested provided that the medium heavy swine demonstrate that they have the same chemical-physical characteristics as the raw material normally used; 1 company declares that it is willing to purchase raw material obtained from medium heavy swine only if the price is comparable to that in the rest of market; 33% (14 companies) in the interviewed sample declare they are not interested (Figure 6).

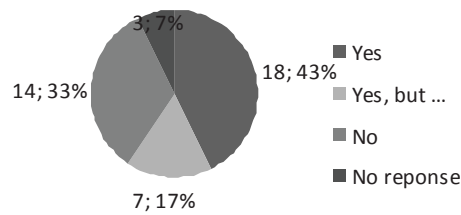


Fig. 6. Speck producers' willingness to purchase medium heavy swine, % of responses

Source: own research

## Conclusions

Ever more frequent food scares have made Italian and European consumers wary of imported products and increasingly willing to buy Italian articles or of other certain origin [Tregear & Giraud 2011, pp. 63-74]. This conclusion also emerged from an analysis of consumers in Piedmont (now being published) which reveals the sample's particular interest in certifications of the raw materials with regard to Italian origin (76.23%) and supply chain traceability (52.32%).

To cater to these ever more pressing needs, both the EU and the Italian legislator are currently drafting regulatory instruments that require new information in labels. The most recent EU regulatory proposal envisages compulsory indication of the origin of all meat [Capparelli 2011, p. 24]. Recent national legislation (law no. 4/2011, art. 4 c. 2) mandates compulsory indication in the label 'of the place of final substantial transformation and place of cultivation and growing of the main agricultural raw material used in the preparation or in the production' of transformed food products [Correra 2011, pp. 15-20]. The decrees enacting the law will be issued shortly: the first of these should be addressed specifically to the meat sector and could therefore also involve the speck supply chain.

Therefore, similarly to other major Italian production supply chains, the speck supply chain will have to cope with the now consolidated critical conditions tied to procurement of the raw material and, in particular, origin: almost 98% of the cuts used come from the EU countries (Germany, Austria, Holland and Denmark), leaving Italy a quota of just over 2%. However, Italy is the reference market of the finished product, absorbing around 81% of production: in this context, it can be assumed that an increasingly transparent label will

improve the information furnished to the consumer who will develop further evaluation criteria in food product purchase phases.

According to the results of the survey, there is an evident growing need to cater to consumers' requirements and various large companies in the speck supply chain have already launched small production chains supplied exclusively with Italian raw material.

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