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**Spaces, environments
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**Espaces, environnements
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**Spazi, ambienti
e paesaggi dei terroir**

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Characterization of a dairy mountain product: the "Sarass del fen"

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ABSTRACT: In Piedmont the production of fresh ricotta cheese on the part of farming industries is very restricted. On the contrary, the production of ripened ricotta cheese, easier to preserve and transport, is more widespread, especially among margars. One of these, known as "Sarass del fen" is only produced in some alpine valleys in the Torino province by using the serum of cow, sheep, and goat milk, ripened from 20 days to 4 months and wrapped during ripening, according to tradition, in special alpine herbs coming from the mountain pastures in the area. This work reports the preliminary results of a survey destined to define its production technology and composition, also in support to the request of Brand Denomination (POD).

Introduction

If we were to classify, for a mere didactic purpose, the huge Italian agro-alimentary patrimony, we could locate two big categories:

- "generic" or "mainstream" agro-alimentary products, lacking any connection with the land of origin, usually industrially obtained, using technologies and first matters scarcely differentiated or not at all, with reproducible and constant compositional and sensorial characteristics;
- "typical" agro-alimentary products, which instead show a strong connection with the land of origin and constitute the sincere expression of a land's cultural, economical and geographic characteristics. Usually they are obtained with first matters often very characterized and through ancient or very ancient manufacturing technologies, not likely to be reproducible elsewhere.

"Typical" or "traditional" or "local" products, therefore, are all the products whose peculiar compositional and/or sensorial characteristics stem from the tradition through which manufacturers can merge their own experience with the characteristics of the first matters by a unique and unrepeatable process, and they represent a wealth not only under a cultural point of view, but also in the economical sense thanks to their skills in "pulling along" other fields (such as the tourist-recreational one) and satisfying customers' expectations.

It is therefore essential that they are protected and developed, since their development does not only represent the safeguarding of a production tradition, but also and most of all the safeguarding of the manufacturers themselves, allowing for their presence is often disadvantaged and marginal sites like those lying at the feet of mountain ranges.

To this end the D. Lgs. 173/98 and the following DM 350/99 define traditional products as those «whose production, conservation and ripening techniques are well-established through time [...]» and they provide for each Region or autonomous Province to create local lists of its own traditional products, defining their production area, manufacturing technology and most relevant features.

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In Piedmont, this list, made of description files prearranged on purpose, relates about nearly 200 products almost a quarter of which is made of dairy by-products. In fact, in Piedmont the dairy sector is exceptionally developed both quantitatively and qualitatively speaking, and the production of cheese has always been a prominent socio-economical and cultural resource. So, out of the 30 kinds of cheese that can boast POD according to the CE 2081/92, as much as nine are listed to be produced on Piedmontese land.

Much less spread and known is ricotta cheese, especially the fresh kind, quite hard to preserve and carry. This made it so that in some productive mountain areas, where markets could not be asked for daily production, eventually spread the tradition of ricotta salted and ripened much like a cheese.

The most well-known among these is surely the "Sarass del fen" or "Hay Ricotta", from the dialect word *Sarass*, which means serum (from old Latin *seracium*) and hence that ricotta.

Almost only produced in the Pellice Valley, in the Torino province, the ricotta is characterized by its being wrapped, during ripening, in dried alpine herbs. On average it is ripened for between 30 and 40 days, but it is not unusual to stumble into "Sarass del fen" that was ripened for a few months.

In these past few years the production of this kind of ricotta unfortunately got very reduced and at present it only concerns no more than some twenty manufacturers. With the purpose of preventing it from disappearing completely, the "Slow Food" Association created a "Praesidium" dedicated to its protection and development, while the Agricultural Assessorates of the Piedmont Region and the Torino Province financed a broad survey in order to investigate technological, compositional and sensorial knowledge, also in anticipation of a POD request.

The survey is structured in two phases: definition of the production process of "Sarass del fen" through a census taken among production industries and definition of compositional and sensorial characteristics of the product as can be found on the market.

Despite the survey being still in progress, it has been thought right to disclose in this work the first results of the study in consideration of the attention this product is getting by customers and the press.

Production technology

The ricotta cheese is a peculiar dairy product since it is made by heating and subsequently acidifying milk's serum from a curdling process. This product is rich in soluble proteins, therefore uninvolved in rennet curdling, which, if subjected to heating and attempt at acidifying, get denatured and aggregate in flakes that tend to rise to the surface of the serum itself. These precipitates, when gathered and drained, constitute ricotta cheese, from the old Latin word *recoctus* the Romans used to call this product underlining its double cooking process (Tantillo and Aprile, 2000).

Seen until a few years ago as a secondary curdling product, the ricotta cheese rose in the last years to a considerable economical relevance, not only because of its appreciated organoleptic characteristics, but most of all due to its high digestibility, low fat percentage and richness in sulphured amino acids (Amerio and Verme, 1992; Ziino et al., 1993; Cosseddu et al., 1997; Cosseddu et al., 1999; Lodi et al., 1999; Marchisio et al., 1999).

For the production of "Sarass del fen" serum of cow (90-100%) and sheep/goat (0-10%) milk is used. However, the cases where pure serum of cow milk is employed are quite unusual since in the area Industries with mixed breeding are very well-spread. The serum is heated up to about 80-85 °C and then, as a rule, a 5-10% of milk is added to it in order to increase the ricotta's creaminess and therefore providing it with a better structure. This addition is made when serum temperature has reached about 60 °C. Once it gets to 80-85 °C, curdling is stimulated by adding citric acid or magnesium sulphate. Usually the latter is preferred since, according to some manufacturers, citric acid would result in the product having a bitter taste if it ripened for a long time. However, at present there is no evidence of such an effect. Once the curdle flakes have surfaced, the serum is heated again up to the 90-95 °C needed to cause a preliminary "draining" of the ricotta. Then extraction, "in pastry" salting, and sheet moulding take place. As a rule, they are hanged for 24-48 hours and this causes the moulding of product in its characteristic hemisphere shape. At the end of this period the ricotta cheese is taken out of the sheet, is salted again if need be, and left to ripening.

After 10-15 days the "hay-turning" phase, i.e. the wrapping of "Sarass" in hay that represents the characteristic feature of this production, takes place. Although the reasons for this practice are unknown, the most reliable hypothesis are the following three: to improve product manipulation during the passage from mountain pastures to the valley market on horseback or on a mule; to add spice to the product; to allow for an easier draining. Nowadays, however, hay-turning is mainly for aesthetic reasons, but its effect on the taste-smell and/or rheological characteristics of the product have not been ruled out. One of the purposes of the survey is in fact examining this specific phase and highlighting its effects on the compositional and/or sensorial characteristics of the "Sarass".

Composition

Although the "Sarass del fen" is a traditional product well-known and produced since centuries, literature does not relate values for its composition.

The research project therefore contemplates filling this gap by determining the composition of some fifty samples of summer and winter production at different ripening stages.

Hereby are reported the results for the first 18 samples of summer production ripened for about 30 days.

In order to determine values for dry substance, fat content, proteins, soluble nitrogen, acidity, nitrogenated extractives, ashes and sodium chloride, the official methods for analysing cheese have been employed (DM April, 21st, 1986).

Assessment of short-chain fat acids, organic acids, sugar, diacetyl and acetoin has instead been conducted through analyses HPLC with Aminex HPX87H column (Zeppa et al., 2001).

The components of the volatile part have been separated through a system of distillation and simultaneous extraction, and examined through gas-chromatography and mass spectrometry (Jesus Sanz e Martinez-Castro, 1991; Careri et al., 1994).

As for macro-constituents, a marked variability, unavoidable in such a craftsmanlike and poorly codified production, has been reported (Tab. 1).

Table 1 - Composition of 18 samples of "Sarass del fen" produce on mountain pastures and ripened 30 days (X = average / σ = standard deviation).

	X	σ
Dry residue (%)	52,22	7,44
Fat (% dr)	63,6	7,4
Protein (% dr)	28,1	5,26
Ashes (% dr)	5,5	1,8
Soluble nitrogen (% dr)	3,8	2,2
Acidity (meq)	4,1	3,2
Nitrogenated extractives (% ss)	2,8	2,3
Sodium chloride (% ai)	1,02	0,3
Energetic value (Kcal/100 g ai)	359	86

(dr = dry residue / ai = as is)

The dry residue of the products examined is usually quite high if compared with the fact that Piedmontese Toma has about 54% of dry substance, pecorino has 65% and ripened provolone 74% (Cantarelli, 1979).

The percentage of fat is very high as well, averaging 60% of the dry substance. In setting this value many elements can contribute: using cow milk mixed with goat milk in a percentage above 10%, the excessive break of the curdling, the addition of and sometimes even cream in the serum during heating, in order to make softer and tastier the ricotta cheese, and lastly using milk coming from cows at the end of their milk period.

Ashes are exceptionally abundant, averaging 5% of the dry substance. The main component of these ashes is sodium chloride, used as a spice and for easier preservation of the product.

Adding to the pastry some generic "handful of salt for each cheese", however, causes a strong

variability in final concentrations, which is what explains such a high standard deviation value. This is surely one of the first parameters to regulate in order to increase "Sarass del fen" production "standardization".

Highly variable is also the soluble nitrogen content, indicating a very different ripening degree in the samples examined, though they had had equal ripening time. There are many factors that can influence this parameter (micro-biological quality of the milk and therefore of the serum, temperature and heating time for the serum, micro-biological quality and quantity of the milk added to the serum, quantity of salt, purging time and intensity, ripening conditions), and in this case a higher production standardization – mostly to benefit the customers – will be needed as well.

Product acidity is usually low, due to the lack of lactic bacteria, and also low is the content of nitrogenated extractives, quite variable from one examined sample to the other as well.

One last consideration comes from looking at the energetic value of the product, which is very high when compared to the average cattle ricotta cheese, barely reaching 200 kilo-calories every 100 g of product as is.

However, it has to be pointed out that in the "Sarass del fen" case, values are referred to products ripened for 30 days and therefore with a dry substance content higher than 40%, while in all fresh ricotta cheese the value is no higher than 25% dry substance.

The same variability experienced in macro-components can be seen in some minor components as well (Tab. 2).

Table 2 – Concentration (mg/kg as is) of some short-chain fat acids, organic non-volatile acids, sugar, diacetyl, acetoin in the 18 "Sarass del Fen" samples examined.

	X	σ
Oxalic Acid	845	644
Citric Acid	703	250
Orotic Acid	275	146
Piruvic Acid	18	15
Lactic Acid	3393	4199
Formic Acid	nd	—
Acetic Acid	455	218
Diacetyl	861	563
Propionic Acid	55	49
Isobutyric Acid	nd	—
Butyric Acid	311	371
Isovaleric Acid	nd	—
Valeric Acid	nd	—
Hippuric Acid	2	1
Uric Acid	6	3
Acetoin	13	3
Lactose	15960	6244
Glucose	133	225
Galactose	196	194

(X = average / σ = standard deviation / nd = not detected)

The scarce maturation of many of the products sampled is the cause for the presence of both citric acid and, most of all, sugar, which usually lacks in other cheese with equal ripening time, and the absence of acetoin and diacetyl. For the same reasons scarce is the presence of short-chain fat acids as well.

Lastly, the volatile part is particularly interesting, and it will be the subject of a future communication, that has underlined the presence, in addition to the components that are typical of a ripened dairy product (acids, aldeids, ketones, alcohols, lactones), of a wide and abundant range of terpenic by-products (limonene, myrcene, ocimene, verbenole, myrtenol, pinene) never experienced before in ricotta cheese and characteristic of cattle feeding based on fresh fodder. Reduced micro-

bic phenomena and the abundance of residual serum caused in some sample a high quantity of these substances, whose presence might be perceivable when eating. Should the analyses still in progress confirm this presence in the other samples, chances for a better definition of the typicality of this specific production and its connection to the land of origin, in order to protect both the customers and the manufacturers themselves, would likely increase.

Conclusions

The "Sarass del fen" is a product where production craftsmanship plays a prominent role. In fact, though it is possible to define a common productive process, there are countless personal interpretations, often commanded by the need to adapt the productive process to the inconstant conditions of the industry. The result is some products which are very different from one another components-wise, especially regarding the fat content, proteins and dry substance, and this not only confuses the customer, it also allows manufacturers in other areas to sell their own product with the renowned "Sarass del fen" brand. There is therefore a clear and urgent need for a production regulation that protects the variability inherent to a manufactured product while at the same time managing to restrain the fluctuations that, as of now, are still too wide, in order to safeguard the customer and the manufacturers themselves.

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