

# A Turning Point in the Italian Dairy Farming System: A Comparison between the *Frisona Italiana* and *Bruna Alpina* Breeds

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**KEYWORDS:** Agro-industry, Agricultural Innovation, Cattle breeding, Regional specialization.

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*This research retraces how the Frisona Italiana, which is renowned for its high milk production, became the most popular breed in Italy during the twentieth century. It virtually supplanted the Bruna Alpina, which was the most widespread strain in the country until the late 1950s. The importance of the Frisona Italiana is not yet fully appreciated and its history should be examined from a comparative perspective due to its peculiar development. The Frisona Italiana has long been differentiated from the original Friesian breed in the Netherlands and the Holstein-Friesian breed in North America, one of the highest dairy-producing cows in the world. Italy was the first country to develop a 'sub-genre' from breeding stock of the Friesian and Holstein-Friesian strains.*

*This article provides an accurate reconstruction of the development of the Frisona Italiana and identifies the path that enabled it to numerically outstrip the Bruna. Specifically, I examine endogenous (yields, techniques etc.) and/or exogenous (livestock farming system, farmers' actions, state intervention, etc.) factors that may have affected decisions to introduce the Frisona breed.*

## Un punto de inflexión en el sistema lechero italiano: una comparación entre *Frisona Italiana* y *Bruna Alpina*

**PALABRAS CLAVE:** agroindustria, innovación agrícola, ganadería, especialización regional.

**CÓDIGOS JEL:** O13, O33, Q16, Q18.

**E**sta investigación tiene por objeto describir cómo la raza de ganadería *Frisona Italiana* –universalmente conocida por su alta producción de leche– se convirtió en la raza más popular en Italia en el siglo XX, superando por un amplio margen a la *Bruna Alpina*, la raza más extendida en el país hasta por lo menos el final de la década de 1950. La historia de la *Frisona Italiana*, cuya importancia aún no se aprecia completamente, tiene que ser examinada también en una perspectiva comparativa porque se desarrolló de manera peculiar y, durante mucho tiempo, diferente a algunas regiones de los Países Bajos (donde se originó la raza –localmente llamada *Frisona*) y en América del Norte (donde la raza *Holstein-Frisona* se convirtió en una de las vacas de mayor producción de leche del mundo). Italia fue el primer país en desarrollar un “subgénero” a partir de la cría de las razas *Frisona* y *Holstein-Frisona*. Además de proporcionar una reconstrucción precisa, pretendo identificar la ruta que permitió a la *Frisona* superar a la *Bruna* en términos numéricos, en particular, examinando si los factores endógenos llevaron a la decisión de adoptar la primera (en términos de rendimientos y técnicas,) y/o los factores exógenos, como la estructura del sistema de ganadería, las acciones adoptadas por los agricultores y la intervención del Estado.

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## 1. INTRODUCTION

Reconstructing the events that led to the selection of a certain breed is important to describe and interpret the radical transformation of the agricultural sector through the “prism” of livestock history. Moreover, taking into account that over the past two centuries industrialisation and the improvement of the cattle population have gone almost hand in hand, reconstructing the history of the breed clearly means investigating social and cultural history, but also the inevitable political implications and the more purely financial reasons<sup>1</sup>. In spite of this, historical studies on this issue are still sporadic (Orland, 2003; Derry, 2003).

From the 1950s onwards, the most important breed of cattle in numerical terms in Italy, the *Bruna Alpina*, was first unseated from its dominant position and then outnumbered by the advent of a “new” cow, namely the *Frisona Italiana*. The aim of this article is to retrace the various historical stages that elevated this breed to such levels. We will try to understand if and how a “handover” between the two breeds took place and whether this led to a productive improvement in the Italian dairy sector. The Italian case is particularly interesting on an international level, given the uniqueness of the *Frisona Italiana* “sub-genre”. It was created from the two “mother-strains”, exhibiting productions and genetic trends that had not been obtained for a long time by other European states and in direct competition with the United States and Canada.

After an assessment of the “state of the art” on the most important aspects for this theme, the article continues with some initial considerations on cattle farming in the years under review. Then it proceeds with an overview of cattle breeding in Italy around the time of the unification of that country, analysing in particular the great territorial variety and, therefore, the different breeding systems of the Peninsula. Particular attention will be given to the *Bruna Alpina* breed, evaluating its characteristics and productive potential; this will be followed by a comparison with the *Frisona Italiana*. The key points of the article and some considerations on the choice of breed change will be summarised in the conclusion.

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1. The food historian MONTANARI (1993) believes that factors such as the production and consumption of meat, milk and dairy products must also be considered to assess the level of development and well-being of a population.

## 2. PRELIMINARY REMARKS

### 2.1. State of the art

The dynamics of technological innovations in this sector are extremely important. One of the most comprehensive texts on the subject is certainly *Masterminding Nature* by Derry (2015). This Canadian scholar examines the theory of purebred animals and the rise of genomics, but also addresses the fundamental practices of artificial insemination and the freezing of bull semen and analyses in detail the various technical and technological innovations that allowed the sector to develop its full potential.

As regards the history of the North American Holstein, the two most important texts are Prescott (1960) and Mansfield (1985). Besides devoting many pages to the genetic advances which, starting in 1940, made Holstein-Friesian breeding increasingly productive and successful, both books retrace the various phases of the breed's history. Starting from accounts of the first cattle brought to Boston from the Netherlands by a Massachusetts breeder in 1852, the publications point out that the new breed's high production levels prompted other breeders to use Dutch bulls. Thus, as early as 1861, associations were established to register pedigree cattle and draw up breed genealogical books. These associations merged in 1885, creating the Holstein-Friesian Association of America. This is extremely interesting when compared to the Italian case, where the absence of national trade associations and, above all, the lack of national herd books of any breed in the territory slowed down the development and improvement of the sector, at least until after the Second World War. Consequently, this affected the breeders' choice of the breeds to buy.

With respect to the Netherlands, this breed's "country of origin", there are several important publications in Dutch (Strikwerda, 1979) and others in English. In particular, Jan Bieleman's book (2010) on the history of Dutch agriculture, emphasises the development of the Friesian, while two articles by Bert Theunissen (2008, 2012) provide a history of this dairy cow breed from the early 1900s to the end of the century. "Breeding for Nobility" is particularly interesting for our case as it records the different opinions on Friesian cattle in the Netherlands from the 1950s. On the one hand, breeders were interested in maintaining the "noble" physical characteristics of the breed, whereas the government was eager to significantly increase the cows' milk production and productivity. In Italy, the Ministry of Agriculture did not want to –or could not– take a stance in the milk production choices of Italian livestock until the Second World War. However, thereafter, farmers and their associations sought to discuss the matter with the central government, especially regarding the selective improvement. This also obviously affected the breeders' choice of the "best" breed.

In the specific case of Italy, there are two important references when analysing the role played by livestock farming in Italy: Barsanti's essay (2002) on livestock farming between the end of the eighteenth century and the post-Second World War period provides useful statistical data on the number of cattle in Italy. On the other hand, Lucifero and Giorgetti (2002) focus more on the key role played by technological innovations and scientific progress in breeding. Although much of their text is related to pig farming, several references are made to the role of innovations in dairy farming, especially in Northern Italy.

In this regard, precisely because Northern Italy, especially the *Pianura Padana* (Po Valley), has been and still is the prominent cattle farming area, it is not surprising that several studies focus on Lombardy<sup>2</sup>. One of the most important books on the pre-Second World War period, although it is now superannuated, is *Un secolo di vita agricola in Lombardia* (Romani, 1963). In his extensive analysis of Lombardy agriculture in the years between 1861 and 1961, Romani devotes a sizable section to dairy farming and the role of animal husbandry, providing interesting statistical data, for example regarding the first censuses conducted by Jacini or the sale and cost of cheese in the first post-unification period. The increasingly important role of higher- and intermediate-level agricultural education in those years, and of experimentation is also addressed. With regards to the latter, the references to the Lodi Experimental Dairy Station made by Romani can be examined in greater detail in several essays. Banti (2004) and, especially, Cavazzoli (2002) analyse the fortuitous combination of factors (the predominance of meadows in rotation with Ladino clover in irrigated lands and lucerne in dry lands, for example) which provided favourable conditions for breeding dairy cattle and, therefore, the development of the dairy industry, the mainspring for setting up experimental institutes to improve milk yields and quality<sup>3</sup>. In the same text, reference is made, as in Romani's book, to the important role played by the agricultural livestock breeding schools (primarily, the one in Reggio Emilia) in training farmers, cheesemakers and, in general, the many agricultural workers who did not yet have professional training, without whom technical innovations would have been ineffectual<sup>4</sup>.

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2. The large number of territorial and environmental varieties of cattle found in the Lombardy area prompted several scholars to analyse the differences (BESANA, 1998, 2003; SUCCI & SANDRUCCI, 2000).

3. On the link between agriculture and industry in the Po Valley see, among others, CAZZOLA (1993), and TEDESCHI and STRANIERI (2011).

4. On the correlation between the level of education and the development of agriculture and industry in Italy between its unification and 1914, see ZAMAGNI (1978).

## 2.2. Initial considerations

As shown in Table 1, the Italian cattle population increased progressively over the years, from the Unification of Italy to at least the 1960s. The first official census of 1875 recorded 3,489,125 cattle, with large differences between regions, and a primacy in the fertile plains of the north<sup>5</sup>. The second national census of 1876 concerned only horses and mules, while the third, in 1881, indicated a total of 4,783,232 cattle (MAIC, 1882); the fourth was conducted in 1908, with a total of 6,198,861 animals (MAIC, 1910). Successive national censuses reveal a constant increase in the number of animals, even in the most difficult periods of Italian history. For the period between 1945 and 1960 the statistical yearbooks of agriculture (*annuari di statistica agraria*) continued to show a progressive increase in the number of Italian animals. Only in 1961 a new agricultural census was drawn up and still showed an increase in the cattle population in Italy. However, ten years later the data recorded show the first decrease in Italy's cattle population<sup>6</sup>.

**TABLE 1**  
**Numerical consistency of Italian cattle in Italy, 1875-1970**

Year	Total cattle
1875	3,489,125
1881	4,783,232
1908	6,198,861
1918	6,239,341
1930	7,108,499
1940-43	8,384,561
1961	9,485,095
1970	8,696,401

Sources: MAIC (1875, 1882, 1910, 1921), Istituto Centrale di Statistica del Regno d'Italia (1934), ISTAT (1961, 1971-76), Barsanti (2002).

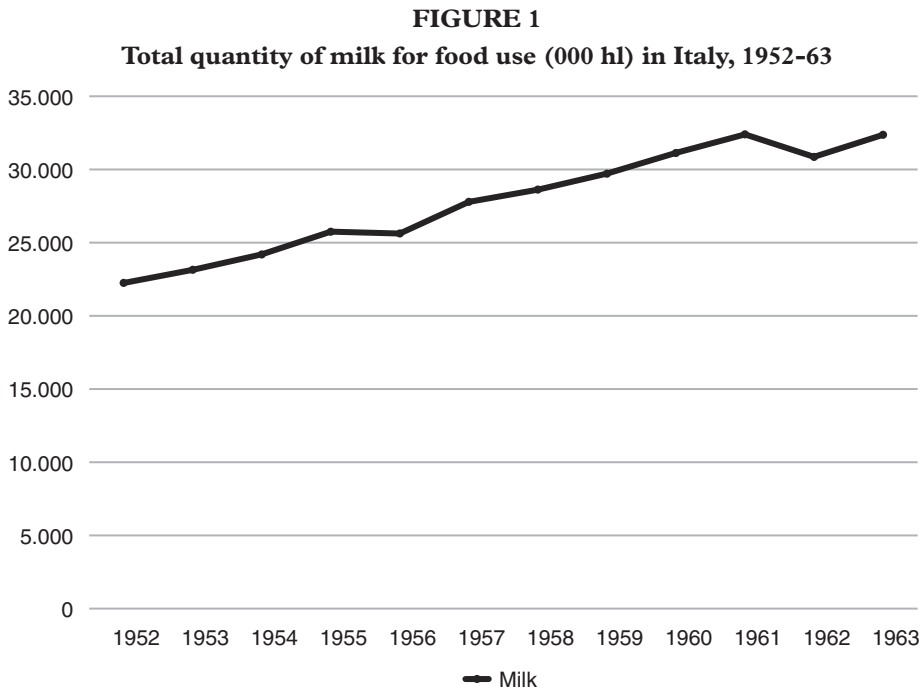
Despite this progressive increase in the number of animals, until the 1960s cattle farming was aimed at subsistence in most of Italy. There was a prevalence of small family-run farms and the production of animal feed was based almost exclusively on fresh, silage or

5. The census of 1875 is not the first revelation ever. According to the Italian Statistical Yearbook of 1864, there were 3,708,635 cattle, although this data is not completely reliable, due to different data collection systems in each pre-unitary state (Barsanti, 2002). Regarding differences in numbers of cattle, while the national average was 11.8 cattle per km<sup>2</sup>, in the north this figure rose to 20 and in the south it fell to 2 cattle per km<sup>2</sup> (MAIC, 1875).

6. Although for the period between 1945 and 1960 the statistical yearbooks of agriculture continued to show a progressive increase in the number of Italian animals.

hay fodder (Dell’Orto & Baldi, 2014). The aim of this rearing system was therefore merely to satisfy the needs of the family and small local communities and was thus totally unsuited to supporting the growing demand for beef and dairy products by the Italian population (Moreno-Altamirano *et al.*, 2017).

The growing demand, from the 1950s, for milk (Fig. 1) because of the greater economic availability and the increase in the population, led to a rapid transition to an increasingly more suitable and specialised breeding system.



Source: ISTAT (1954-65).

This new system was highly focused on innovations that could improve the productivity of the sector, as in the case of other European countries. The importance of innovation in the period is evident throughout Western Europe (Grigg, 1992; Federico, 2009), with obvious effects also in the changes occurring in individual nations (Bruno, 2020; Fernández Prieto & Lanero, 2020; Theunissen, 2012; Labatut & Tensière, 2017) related to the intensification of animal production through the livestock stabling process, changes in feed and animal fattening or in the agricultural products used for feeding and, in particular, the improvement in the production of breeds reared by means of increas-

ingly sophisticated tools. All of these aspects rendered the traditional processes inapplicable (Fernández Prieto & Lanero, 2015)<sup>7</sup>.

The Italian case is therefore no exception: by increasingly moving away from the concept of “cow, the necessary evil” (Slicher Van Bath, 1972) (*i.e.* the animal as a working tool which, however, took away the soil from crops), Italian breeding in the first and, above all, second post-war period increasingly focused on specialised, single-aptitude farming. This article, therefore, forms part of the debate on the capacity of Italian agriculture to change (Federico & Malanima, 2004; Federico, 2009), providing new considerations in this regard.

However, what characterises the Italian case is its enormous diversity of territory, rich in mountainous, hilly and flat areas, and, therefore, of breeding systems. For this reason, in the first part of the article we will contemplate statistical data on the presence of the two breeds with increasingly disaggregated data (regional, but also local). From these considerations we can draw a common but fundamental assessment of knowledge: the area most suited to the production of milk is the Lombard plain (Po Valley). For centuries its characteristics were much more advanced than the rest of Italy and its technological progress was already on the same level as that of the twentieth century. The article, therefore, will focus specifically on this area, where, among other things, the switch from one breed to another took place first, a sign of a predilection of the local sector for a production designed for large retailers and managed in a more centralised way.

The sector was hitherto run by a bottom-up logic, whereby the individual “pioneer” farmers developed and applied new techniques on their plots and which were rarely used by all farmers; but, with the “complication” of the sector, together with the logic of the Green Revolution (Perkins, 1997), the industry became centralised. This did not mean that everything was decided on a state level, but that individual breeders were no longer able to compete independently, so they preferred to join breed associations in order to better intercept technological and non-technological changes in the industry.

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7. During these years, there was a significant scientific and technological evolution in animal nutrition, moving from a diet based largely on hay and grass silage to carefully balanced and formulated diets, with the aim of maximising performance. DELL’ORTO and BALDI (2013: 29) write that “the progressive increase in the average size of livestock has necessitated a major structural overhaul at the same time in order to contain as much as possible the costs of a workforce which is increasingly represented, especially in the larger companies, by wage-workers. The progressive expansion of the livestock structures has led to the abandonment of the use of static post in favour of multiple boxes with grill paving, with the main advantage, as well as a reduction in fixed and labour costs, of a reduction in the cost of managing manure”.



### 3. CATTLE BREEDING DURING THE UNIFICATION OF ITALY

After the Unification of Italy, the new socio-political governance was only marginally interested in agriculture. The state maintained the legal framework of the Kingdom of Italy under the House of Savoy, updated by the Rattazzi Law in October-November 1859, to redesign the administrative geography of the kingdom, after Lombardy was added to it. This period saw the reorganisation of codes, public services and justice, but there was no immediate clear interest in reforming the country's agriculture<sup>8</sup>. This was also the case in the central phase of post-unification because no proper statistical survey was conducted by the government<sup>9</sup>. However, during the Congress of the Itinerant Teachers of Agriculture (*cattedre ambulanti dell'agricoltura*), held in Milan on 23 September 1906, Bartolomeo Moreschi (at the time chief inspector of the zootechnical service at the Ministry of Agriculture) mentions the cattle population census carried out in 1881<sup>10</sup>. Nevertheless, he states that the data were insufficient to provide a clear idea of the number of animals that were present in Italy<sup>11</sup>.

The Italian cattle population in 1870 was still particularly "hybridised" and, above all, differed widely between the various regions. This is because, prior to the Unification of Italy, each state had developed its own "breed" (although it is still too early to speak of breeds at this stage) with different physical and productive features<sup>12</sup>:

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8. Refer to CAPONE (1981: 24).

9. There was even a lack of overall numerical data on the real Italian livestock population. It is important to remember that only following the Royal Decree No. 1035 of 2 June 1927, *i.e.* when the functions relating to agricultural statistics were entrusted to the Central Institute of Statistics, was the quantity and articulation of data sufficiently consistent. The first official livestock census was prepared in 1928 and conducted in 1930. In spite of this, Cesare Correnti and Pietro Maestri published in the Italian Statistical Yearbook of 1864 an estimate, which is obviously difficult to verify, of 1,391,731 cattle in the country (ISTAT, 2011; BARSANTI, 2002: 105-6).

10. The Itinerant Teachers of Agriculture were voluntary organisations, comprising agronomists and set up to provide agricultural support but also meetings, conferences, practical lessons and, in several cases, they conducted experimental fieldwork and other activities related to teaching, or propaganda. For further information, see ROGNONI (2006) and FILENI (1954).

11. "You well understand gentlemen that I cannot tell you how many cattle there are in Italy today. [...] It is necessary, as I have already said several times, that a rigorous statistical survey be set up by the government for this purpose. [...] And it is not necessary to use the figures of the census carried out in 1881, that is, 25 years ago. The data from that census are not reliable because they were not collected properly, no uniform criteria were used and they were not checked" (MORESCHI, 1906: 4).

12. As regards the term *breed* and the fact that a real concept of breed did not exist in Italy at the end of the nineteenth century, reference is again made to Moreschi's statement in 1906: "By using the terms Italian breeds or varieties of cattle, I do not intend to give these words the value they are given in the treatises on animal husbandry. This is because in Italy we still do not have a classification that rationally corresponds to well-defined characteristics of the cattle found in the various areas of

“Before the Italian Unification, the fragmented conglomeration of states were fierce rivals, also in terms of custom barriers and with the added problem of transport difficulties between them, thus agriculture was focused on local needs” (Cornalba, 1926: 583).

Cattle were mainly bred as working animals or for animal-powered transport, while beef was derived from animals that were no longer able to work or be used for transportation. Their meat was used by farmers for self-consumption and some of it was sold in local markets. Even in terms of milk, given the transportation difficulties, consumption was limited to areas near the farms. Nevertheless, there was a flourishing trade in long-lasting cheeses in the flat plains of Northern Italy. Animals were not sold between the different states due to the high customs duties or because at the time there was no production improvement culture. They remained on the farms they were raised on throughout their lives.

Indeed, the absence of relations in the livestock sector between the various states was only one of the many aspects of the lack of communication in the economic sphere in Italy, which began in the sixteenth century due to the decline of the Mediterranean Sea trade route and the waning interest in continental Europe<sup>13</sup>. Furthermore, the different peninsular agricultural landscapes had resulted in different livestock farming systems. It is obvious, even with the scarce statistical data available, that dairy cattle breeding prevailed in the Po Valley, while buffaloes, donkeys, mules, sheep, goats, and pigs were concentrated in Central and Southern Italy.

Although breeding was widespread across almost the whole country, the type of animal bred and their numbers had to meet the needs of the individual farm, the availability of fodder and the diverse agricultural landscape.

For Northern Italy, we need to make a distinction between mountainous and flat areas. For the former, the above text states<sup>14</sup>: animals bred in this area were hardy, rustic and did not require much food. There was the *Grigio Alpina* at the foot of the Alps<sup>15</sup>; the

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the country. This classification must be performed” (MORESCHI, 1906: 6).

13. “In fact, all the various regional States were becoming integrated into Europe, increasingly abandoning their economic and trade relations with each other and exposing themselves to the dominance of the Central European Countries” (CAPONE, 1981: 126).

14. “Cattle breeding in small farms –common in many areas of plateaux, hills and mountains– was very modest due to technical and economic reasons, such as the inability to keep animals and the lack of capital. [...] In small farms, specialisation was impossible. Not only steers and oxen, but also heifers were used to work the fields and for draught purposes” (FUMI, 2014: 95).

*Cabannina* in the Ligurian mountains<sup>16</sup>; the *Piemontese* and *Pezzata Rossa Valdostana* in Piedmont<sup>17</sup>; the *Rendena* in Trentino<sup>18</sup>; the *Burlina* in southern Veneto<sup>19</sup>; the *Pinzgau* in Bolzano<sup>20</sup>; and the *Tortonese* in the western part of Northern Italy<sup>21</sup>.

The situation in the Po Valley was completely different: this area specialised in milk and meat production and cattle were only partially used for work. The *Bruna Alpina*, as well as the *Reggiana* and *Modenese* native breeds, were raised in the medium and large-sized farms of the plains, north of the River Po<sup>22</sup>. The breed in the eastern area of the Po Valley was the *Pezzata Rossa Friulana*<sup>23</sup>.

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15. Originally a triple-purpose breed, today the *Grigio Alpina/Grauwieh* is found in the eastern Alpine areas as it is rustic and provides good milk and beef (BIGI & ZANON, 2008: 29-31).

16. A local breed, which originated in the plain of Cabanne, in Val d'Aveto (between Genoa and La Spezia). Crossed with Brown Swiss, it has taken on its colour, but it has maintained its original rusticity, as can be seen from its low milk production and small size (BIGI & ZANON, 2008: 14-15).

17. *Piemontese* is a typical beef breed (whose unique feature is the muscular hypertrophy, known as the *double muscle factor*) The *Piemontese* is bred especially in Piedmont and in the surrounding areas of the Po Valley. Its coat is grey or pale fawn (CNR, 1983: 83-4). *Pezzata Rossa* is a cattle breed derived from the inter-breeding of various local breeds and types of cattle, the most important influence coming from the *Simmenthal* breed. Appreciated above all for its good milk production (33-5 quintals per lactation with 3.5% fat and 3.3% protein), from which the Aosta Valley Fontina cheese is obtained, it also provides appreciable meat yields (BIGI & ZANON, 2008: 90-1).

18. A highly rustic brown/black breed, it is an excellent milk producer, considering its small size (average production of 48 quintals). It is well-suited for mountain pastures. Most of the population spends the summer months in the Alpine pastures of Val Rendena and the Asiago plateau (BIGI & ZANON, 2008: 69-71).

19. A population with a pied black-and-white coat, originating in the Veneto Pre-Alps, it belongs to the group of animals registered as "native cattle populations and ethnic groups with limited distribution". At present, distribution does not exceed 300 head of cattle (CNR, 1983: 57-8).

20. A double-purpose breed of Austrian origin which has clearly been influenced by the *Simmenthal* breed. In Italy, it is currently reared mainly in South Tyrol (Alto Adige) (BIGI & ZANON, 2008: 56-7).

21. The *Tortonese* breed, also called *Otonnese* or *Varzese*, according to the local ecotype, was appreciated for its adaptability and robustness and bred in the Apennine areas between Lombardy, Emilia, Liguria and Piedmont. It is among the cattle populations with the lowest levels of distribution (BIGI & ZANON, 2008: 83-5).

22. *Reggiana*, a typical breed of the Reggio Emilia plain, widely appreciated as a specialist milk producer, is used to produce only the renowned Parmigiano Reggiano *di Vacche Rosse*. Bigi and Zanon (2008: 67) write: "In the genetic heritage of Reggiana, compared to other breeds, there is a greater frequency of variant B of K-casein and -casein [...]. This means higher yields, superior rheological properties, better whey purging in the cheese processing phase [...], longer cheese lifespan and consequent better digestibility of its protein and lipid components". *Modenese*, also known as *Bianca della Val Padana*, was originally valued as a triple-purpose breed; today, it is considered a highly rustic double-purpose species (CNR, 1983: 75-6).

23. This good milk producer is crossed with the *Simmenthal* to guarantee a good meat yield.

Thanks to easy transportation and a population density that was higher than the rest of Italy, milk and meat always constituted the most important sources of farm income on this plain. Due to these favourable conditions, the farm produce produced by the larger sized farms in the area exceeded local market needs, unlike the more disadvantaged areas of Central-Southern Italy. Moreover, the increasingly pressing demand for milk from dairies to produce long-life cheeses led farmers to improve their livestock, both through better nutrition and improved selection. Thus, they tried to preserve the best production features of the cows on their farms (Fusco, 1990: 12).

In Central Italy, the cow milk dairy industry was certainly not comparable to that in the dry, irrigated plains of the north. Due to the territory's orography and inadequate water supply, the area was less suited to growing fodder on. Livestock was scarce and of Podolica origin. At that time, cattle were reared using the ancient practice of seasonal transhumance and used primarily for work and, secondly, for meat. Therefore, there was no market or dairy industry to trigger the improvement of the local cattle. The milk produced was used for self-consumption and making fresh cheese<sup>24</sup>. Due to the many woods and hills in the area, the breeding of sheep and goats was widespread as these animals were hardier and well-suited to this type of landscape (Barsanti, 2002: 102 *et ss.*; Cornalba, 1926: 583).

In Southern Italy, agriculture in general and livestock farming, in particular, were even less developed than in Central Italy<sup>25</sup>. Here, no improvement in the cattle population was possible due to the presence of extensive cereal-growing latifundia. Milk production for making fresh cheese was encouraged only in the surrounding areas of the most important cities, due to the high price of the finished product<sup>26</sup>. However, buffalo and sheep's

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24. The cattle breeds raised in this area were the *Romagnola*, *Marchigiana*, *Chianina*, *Maremmiana* and *Mucca Pisana*, all populations of the Podolica strain, which were highly specialised for meat production. They were raised in the Apennine areas of the Papal States. The case of the latter was quite peculiar as it was the only breed in the area with good milk yields because it derived from the *Bruna Alpina*.

25. "In the Kingdom of Naples, the French domination (1806-15) had accelerated the crisis of the old feudal structure that had been preserved throughout the eighteenth century. Moreover, it had started an extensive process of privatizing feudal, state and ecclesiastical estates, mostly to nobles and the rich bourgeoisie. This process, however, did not produce any major changes in traditional farming systems and tillage techniques (always cultivated on a three-year discontinuous rotation) or any start of capitalist transformation of the countryside" (BARSANTI, 2002: 103).

26. In the peninsular area of the old Kingdom of the Two Sicilies, the most reared cattle were those of the *Podolica* breed (deriving from the cattle of the Podolian steppes of Eastern Europe and characterised by good meat yields and fair amounts of milk with a high fat content, used for the production of typical cheeses such as Caciocavallo). These were followed at a great distance by the *Agerolese*, a local dual-purpose population, raised in the mountain area of the Sorrento peninsula, which pro-

milk were preferred. These animals, in fact, were well-adapted to foothills and mountains (Fusco, 1990: 13 *et ss.*).

#### 4. **BRUNA ALPINA: THE MOST WIDESPREAD BREED, 1900-1940**

The *Bruna Alpina* was the predominant breed in Italy even after the Second World War, thus it influenced the innovation of Italian zootechnics for many years. Hence, I think it is important to retrace its history and the events that led it to be replaced by the *Frisona Italiana*, first in the irrigated plains and then throughout most of the country.

Swiss Brown Cattle had been imported into Lombardy since as early as the sixteenth century. This was favoured by the zootechnical specialisation of certain cantons (Uri, Unterwalden and Schwyz) and the improvements in mountain passes, which made trade relations easier. These animals were particularly appreciated because they easily adapted to new climates and produced good meat and milk yields (Corti, n. d.). However, Lombardy lacked the morphological standardisation that in Switzerland had led to the selection of animals with specific characteristics since 1897, when the Swiss breeders' consortia united into a federation (Swiss Federation of Braunvieh Consortia):

“The mid-19th century Braunvieh was smaller than the cattle of the same breed at the end of the century and it was darker, with almost black varieties. The colour was different at the front and back of the animal, compared to the rest of the body [...]. They were often piebald and white-bellied [...]. These features were considered a serious defect, leading to the exclusion of the animals from the breed” (Corti, n. d.).

However, the above-mentioned differences, far from being a problem, had led to the development of strains derived from Swiss animals with different morphological and production features:

“The Italian *Bruna Alpina*, for the specific characteristics of our breeding areas, differs slightly from the classic Swiss cattle. The long-standing selection carried

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duces more milk than the *Podolica*. The products derived from its milk are Fiordilatte and mature cheeses, such as Caciocavallo and Provolone del Monaco DOP. Finally, there was the *Modicana* (a local Sicilian breed with a dark red coat. However, the little milk it produces is rich in fat and used to make Ragusano cheese) in Sicily and the *Sarda* in Sardinia. There was also the *Modicana Sarda*, a crossbreed between the two populations mentioned above. For more detailed information, see CNR (1983: 89-90), and BIGI and ZANON (2008: 41-2, 55-6, 75).

out in this country attempted to produce –and still produces– triple-purpose cattle. Its excellent milk production combines with a good meat yield and, if necessary, they could also be used for not excessively heavy work. [...]

However, the Brown Cattle breed in Italy has slightly different characteristics. [...] Thus, in the Po Valley there was a demand for highly productive livestock. The aptness for work and meat has disappeared, in favour of a greater specialisation in milk production” (Consolini, n. d.: 8).

However, it was only towards the end of the nineteenth century that the Brown Swiss began to spread to other areas of Italy<sup>27</sup>. As evidenced during the above-mentioned conference held at the Congress of Itinerant Teachers of Agriculture in Milan in 1906, at the beginning of the twentieth century the breed was widespread in the Italian peninsula. In this conference, Moreschi stated that “the Brown Swiss breed of Schwyz gained acceptance among Italian breeders. Today, cattle of this breed which are used for reproduction are in great demand in many areas. As a matter of fact, they belong to native breeds and varieties” (Moreschi, 1906: 7). It should be noted that Moreschi did not consider the Brown Swiss as a triple-purpose breed, but rather as a dairy breed with good working skills and meat production. In his opinion, this was why the Swiss bulls were bought to improve the breed in Italy. The result was “early maturing” animals, which were generally well-proportioned, with increased muscle mass, especially in the rear part of their body. Consequently, the cow is more appreciated in markets because “milk production appears to have doubled, and even tripled” (*ibid.*: 7). In fact, in the provinces of Brescia, Bergamo and Milan, where the cattle population was “homogeneous and improved where irrigation was used”, there was a high presence of the “Schwyz” type (*ibid.*: 7). On the Apennines near Piacenza, Parma and Reggio Emilia, up to the Tyrrhenian side of the mountain range, there was “a robust, small, grey-coated cow that was improved with the Schwyz breed” (*ibid.*: 10). In Southern Italy, “Schwyz cattle were valued [...] and considered very useful to improve primitive or endangered breeds, by increasing their weight” (*ibid.*: 17). In Sicily, although the region had few cattle, a Swiss-Sicilian crossbreed was raised near some

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27. Corti (n. d.) states that the orientation of technicians and lowland breeders, who were more powerful and prestigious than their mountain counterparts, imposed the systematic spread of the Schwyz animals, which were considered superior in terms of robustness, to the detriment of the “Italian strain” with a milk vocation. This is confirmed by some of Consolini’s statements (n. d.: 16): “Evidently, in such conditions, which can be said to be an intense exploitation of the dairy cows, in an unhealthy environments of tie-stall facilities, where there is an excess number of animals, they are stressed and their health deteriorates so much that their productive life is shortened [...] It is precisely this situation which has provided [...] the opportunity to turn [...] to the Alpine areas where [...] robust and healthy cattle are available and therefore able to resist exhausting exploitation for a longer time”.

large towns. It was bred to improve the fattening performance of the local type of cow. In Sardinia, especially in the north, Moreschi documented the Swiss-Sardinian crossbreed. The case of the lower area of Lombardy (the *Bassa*) is particularly interesting. Here livestock was improved by mating Brown Swiss with black-and-white Dutch animals<sup>28</sup>. However, this reveals the strong market-centred vision of Italian breeders, who were more interested in the yield of their cattle than their pedigree<sup>29</sup>. This is what led to the creation of the “zootechnical hotchpotch”, jokingly referred to by Moreschi in the lower area of Lombardy:

“However, farmers in Lower Lombardy [...] asked themselves a very precise question: how could they increase their milk yield? Favoured by the environmental conditions and aided by appropriate tools, they succeeded in achieving this goal and their financial results proved they had done the right thing. In addition, the Mantuan farmers, who in different parts of the province had proposed breeding the Apulian, Schwyz, the Simmenthal breeds and the related crossbreeds, were also right. Oh, what a hotchpotch!” (Moreschi, 1906: 9).

Despite this crossbreeding, the “pure-bred” Brown Swiss still prevailed, especially in Lombardy, as confirmed by the first provincial herd book of the breed was drawn up in Crema<sup>30</sup>. Moreover, Moreschi’s statements do not refer to any numerical data. To confirm the data, we must use the Kingdom of Italy’s general censuses. However, in the first general agricultural census dated 19 March 1930, the country’s livestock was divided into animal species (horses, cattle and buffaloes, pigs, sheep and goats), but there was no distinction made between the cattle breeds. It is therefore not possible to use these data to evaluate the importance of the Brown Swiss in Italy (Istituto Centrale di Statistica del Regno d’Italia, 1934: 46-93).

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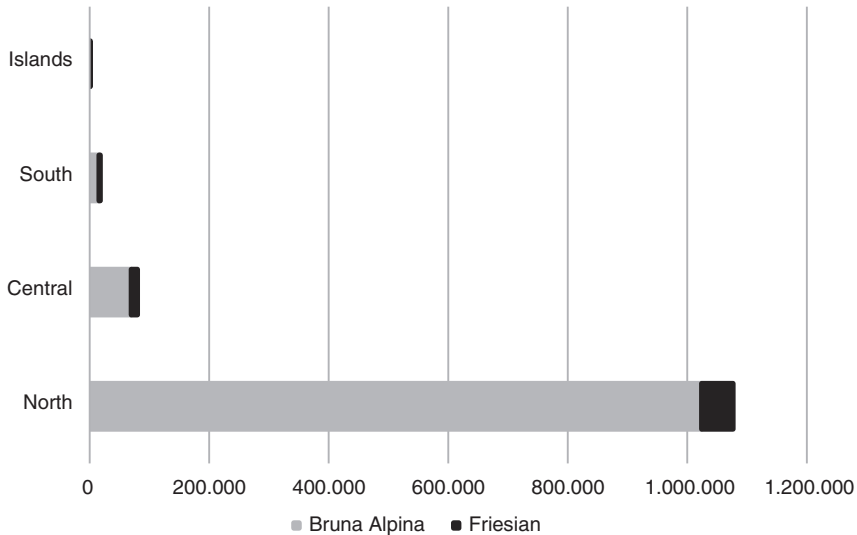
28. “[Here] breeding for milk production [...] is more advanced, more evolved. The Schwyz is also crossbred with Dutch cattle and vice versa, to create ‘high milk producing dairy cow’. If they are supported by appropriate and abundant feed (and the region was rich in fodder), crossbreeds are more profitable” (MORESCHI, 1906: 9).

29. “[...] in animal husbandry, making a profit led wise breeders to act in a certain way. Therefore, gentlemen, do not follow doctrinal preconceptions, outdated theories, absolute principles, nor be afraid of being blamed by those who live influenced by prejudices. Rather, consider things carefully and be set in your purpose” (MORESCHI, 1906: 8).

30. “In order to have an inventory of the best cattle, in 1910 the Crema section of the Itinerant Teachers of Agriculture of Cremona promoted the creation of a herd book of Brown Swiss dairy cattle. It was the first in Italy and it gradually came to include small dairy farms scattered around the province” (FUMI, 2006: 101).

The prevalence of Brown Swiss on a national level compared to the Friesian is confirmed by the data contained in the 1936-38 Statistical Yearbook of Italian Agriculture (Istituto Centrale di Statistica del Regno d'Italia, 1940: 128-31) (Fig. 2).

**FIGURE 2**  
**Cattle census by breed and geographical area, 1938**



Source: Istituto Centrale di Statistica del Regno d'Italia (1940).

The section “cows according to breed, March 1938”, reports that in the entire Kingdom of Italy there were 1,109,870 *Bruna Alpina*, followed, at great distance, by other breeds<sup>31</sup>.

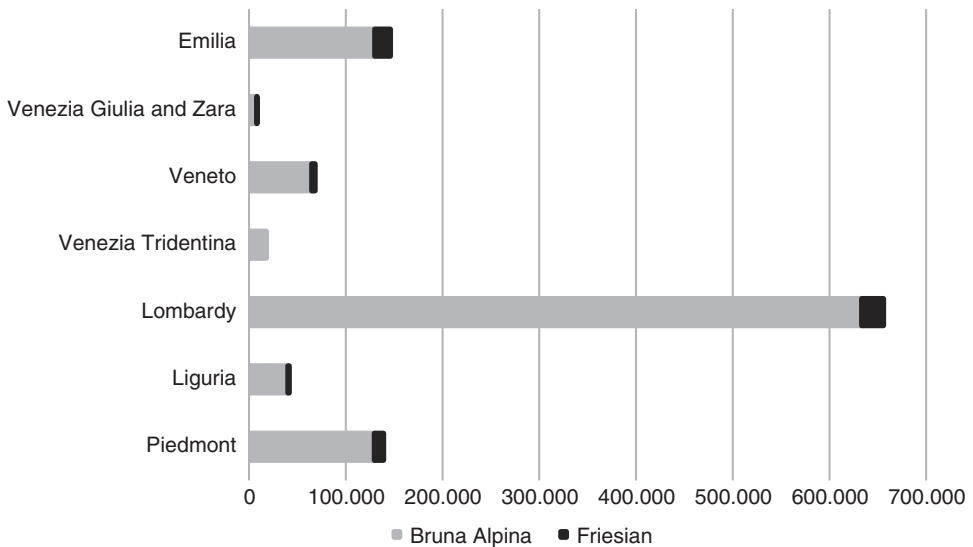
Almost all the Italian *Bruna Alpina* animals were to be found in Northern Italy, which was the most suitable area for dairy farming<sup>32</sup>. The same applies, although in smaller numbers, to the Friesian: 52,470 cows in the north out of a total of 65,310. In the other areas of the country, the *Bruna Alpina* was a minority breed<sup>33</sup>.

31. The *Piemontese*, *Friulana*, *Bolognese* and *Marchigiana* together amounted to 651,430 cattle. The figure for *Grigio Alpina*, *Reggiana* and *Chianina* was 311,310, while that of the *Valdostana*, *Grigia di Val d'Adige* and *Modenese* was 236,390. Numerically important were also the *Podolica*, which alone accounted for 220,810 animals, and the *Romagnola* (128,770), while the *Maremmiana*, with 85,370 cows, and the Friesian, with only 65,310, were a minority. Data were also confirmed by the number of crossbred cows: 233,980 daughters of *Bruna Alpina* bulls, 74,480 *Chianina* and *Grigio Alpina*, while the number of female calves of Friesian bulls was just 34,100. Finally, crossbred cows from *Podolica* bulls totalled 33,300.

32. In comparison with the afore-mentioned country total of 1,109,870 cattle, 1,024,060 were in this area.



**FIGURE 3**  
**Cattle census by breed and region, 1938**



Source: Istituto Centrale di Statistica del Regno d'Italia (1940).

Given the predominance of the northern regions, we should consider each region belonging to this area on an individual basis (Fig. 3).

The Lombardy region had the highest number of *Bruna Alpina*: 633,350 pedigree and 32,170 crossbred cows. The only competitor in the area, although with significantly lower numbers, was the Friesian breed, with 22,440 purebreds and 16,300 crossbreds<sup>34</sup>.

33. In Central Italy, there were only 69,540 cattle while, for example, in *Chianina* there were 98,930 and in *Maremmiana* 83,390. In Southern Italy, the 15,490 *Bruna Alpina* cattle were exceeded by 91,340 *Podolica*. The data for the islands of Italy was extremely interesting: there were only 780 *Bruna Alpina* cattle and 90,430 animals of breeds that were not further specified.

34. The numerical supremacy of the *Bruna Alpina* over the other breeds continued only in Emilia, (129,940 *Bruna Alpina* against 95,510 *Modenese* and 80,180 *Bolognese*) and Liguria (40,240 *Bruna Alpina*, followed by 5,110 *Piemontese* and 4,520 *Valdostana*). In other regions, the breed was overtaken by local cattle, although it was still numerically important. In Piedmont, the 129,620 *Bruna Alpina* cattle were second only to the *Piemontese*, amounting to 294,010. In the region now known as Trentino-South Tyrol (Venezia Tridentina in Italian), 17,850 *Bruna* cattle were slightly exceeded by 21,620 *Grigia di Val d'Adige*, while in Veneto the record was 144,840 *Grigia Alpina* as opposed to 64,920 *Bruna Alpina*. In Venezia Giulia and Zara, there was a numerical superiority of the *Podolica* breed, totalling 13,230 cattle, over the 8,140 *Bruna Alpina*.

Since Lombardy was the most productive area, it should be remembered that very different environments coexisted within its territory: the Alpine region marking the northern boundary of the region, the pre-Alpine area that descends into the flat area delimited to the south by the River Po, to the east by the River Mincio and to the west by the River Ticino. As for the plains, the soil characteristics also differed across the various areas: the so-called lower Po Valley (Mantua, Brescia, the province of Cremona and the southern part of the province of Bergamo) was characterised by clayey, fertile soils, while the remaining area had springs and, in general, loose, decalcified soils. This diversity led to different agricultural activities:

“[...] we see that from the exploitation of the high mountains with woodlands and pastures, we move on to the use of hills for vines and cereal crops, to intensive farming in the plains with systems and measures that are not found in other regions of our country, with large areas for meadows and cereal crops (including rice) and specialised animal husbandry for milk” (Consolini, n. d.: 12).

It is clear, therefore, that the presence of permanent meadows in the mountains, valleys and on the Alpine slopes favoured and still favours the presence of the *Bruna Alpina*. The same phenomenon occurred in the area extending from the Pre-Alps to the lowland springs, which is drier than the lower Po Valley. On the other hand, a key feature of the latter was irrigation. Within the crop rotation system, intensified by the presence of water-meadows, a large area was used for forage crops. This, in turn, favoured the breeding of highly specialised dairy cows<sup>35</sup>.

Therefore, given the geographical and agrological diversity of the region, we can attempt to understand the different distribution of the *Bruna* by examining several data relating to individual districts (Fig. 4).

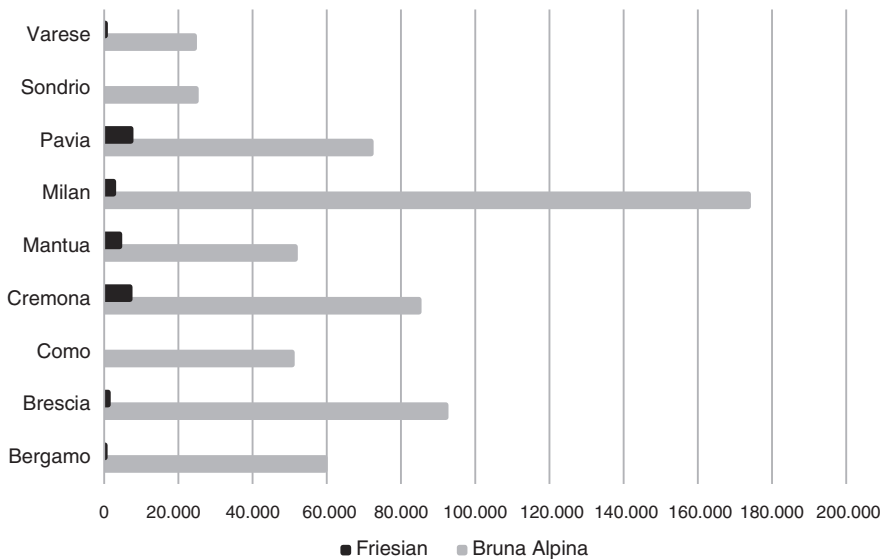
Milan had 173,640 *Bruna* as opposed to 2,540 *Friesian* cows. In Brescia, the number of *Bruna* animals was 92,130, while there were only 1,060 Friesians. In Cremona there were 84,860 *Bruna* cows<sup>36</sup> and 6,950 Friesians. The figures for Pavia and Mantua were peculiar. The former, in addition to 71,930 *Bruna* animals and 7,190 pure Friesian cattle, had 13,350 Friesian crossbred cows, while the latter had 2,600 crossbred

35. “As a matter of fact, a rotation that left ample room for forage, the presence of water-meadows [...], the use of concentrated feed that was produced or purchased and permanent housing create the most suitable environment to stimulate cows to produce the highest possible milk yields” (CONSOLINI, n. d.: 13).

36. To which another 10,190 crossbred animals should be added.

cattle. The data of the three mountain districts (Bergamo, Varese and Sondrio), where the Friesian almost completely disappeared because it was considered unsuitable for their orographic conditions, are particularly interesting. Indeed, in Bergamo there were 59,520 *Bruna* animals and only 230 Friesians, while Varese had 24,310 *Bruna* cattle and 310 Friesians. Finally, in Sondrio, there were no Friesian cows at all and a total of 24,810 *Bruna* cattle.

**FIGURE 4**  
**Cattle census by breed by Lombardy districts, 1938**



Source: Istituto Centrale di Statistica del Regno d'Italia (1940).

Data referring to that period also show the average annual production. A study conducted in 1939 stated that:

“[...] in Lombardy, the *Bruna Alpina* (purebred) produces an average of 26 hl [...], as opposed to the Friesian (purebred) average of 30.6 lt. [...].

In Milan, the average is of 30.1 hl for pedigree *Bruna* and 36.9 hl for Friesians” (“Indagine...”, 1939).

As expected, these data show that the annual average for Lombardy was much higher than that of the entire Kingdom of Italy (18.1 hl) and of Northern Italy itself (19.9 hl) (“Indagine...”, 1939). The figures also reveal that the productivity of Friesian cattle was

higher than that of the *Bruna*. Despite this, breeders did not find the Friesian breed attractive. As a possible reason, I will quote Moreschi once again. On the possibility of breeding the Friesian as purebreds, his vision was the most common at the time, *i.e.* that this breed was not suitable for the Italian soil, not even for the Po Valley:

“It is a dairy breed which, however, is not as adaptable as the Schwyz, therefore it is often necessary to replace them [...].

I wish to warn you, as I have already said before, that you must be prepared to spend a large amount of money on frequent and wide-ranging replacements if you want to maintain the advantages of the breed. It is also necessary to have the right environment for pure breeding. I do not know if this is an easy condition for us to achieve” (Moreschi, 1906: 24).

This reasoning remained widespread for a long time. Even after the Second World War, farmers were convinced that Friesians were only suitable for certain areas of the Po Valley, while for other parts of Lombardy the *Bruna Alpina* was the best choice from a management point of view<sup>37</sup>.

## **5. FRISONA ITALIANA BECOMES THE FAVOURITE BREED, 1950-70**

Considered the best breed due to its morphological characteristics and milk yield, the *Bruna Alpina*, was increasingly used throughout Italy, reaching in 1950 the remarkable figure of 1,900,000 cattle nation-wide. It by far exceeded the 700,000 Brown Swiss of Switzerland, the 600.000 of Germany and the 330.000 of Austria (Tonidandel, n. d.: 4).

This increase in the number of animals occurred at the expense of native breeds, considered to be inadequate for the new national production system, which was characterised by new, increasingly industrialised dairy requirements. In fact, the productivity of the *Bruna Alpina* was higher than that of local breeds and it adapted easily to the various Italian environments. However, in the Lombardy irrigated plains it was quickly being replaced by the Friesian breed, which was more suited to the production capacity of the area. This is confirmed by various articles in newspapers and trade magazines of the period, which

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37. “Some areas of the plain, due to their fodder production capacity, healthy environment in which they were kept and the work skills of farm workers, can welcome with profit the most demanding *Pezzata Nera*. Nevertheless, vast areas of Lombardy, either because they are dry or, even if they are irrigated, required livestock that was resistant to the stress caused by their intense exploitation, are characterised by a large presence of the *Bruna* of the Alps” (CONSOLINI, n.d.: 73).

compared the *Bruna*, Friesian and North American Holstein. Luigi Rossi, in an article which appeared in the periodical *L'allevatore*, dated 5 July 1953, wrote: "The *Bruna Alpina* breed is still the most important in Italy". After reporting that in the previous year 6,757 animals had been imported from Switzerland for 180 million *lire*, he dwelt on the fact that the competition by the Friesian, Holstein and, in recent times, the Danish Black-and-White breeds, had forced Swiss breeders to improve their livestock in order "not to lose the important Italian market". In Rossi's opinion, this was working well. He therefore urged Italian farmers to observe the many initiatives that had been carried out in recent years by their Swiss counterparts. After explaining the activities focused on the selection of animals, he asked: "What are Italian breeders looking for in the *Bruna Alpina*?". For him, the answer was: "Milk and meat". The article ended praising the *Bruna* and listing the cow's excellent features:

"The short time required to reach fertility and start calving are not qualities that pertain only to the *Bruna*. Instead, their qualities are longevity, progressive increase in lactation, adaptation and resistance to harsh climates and scarce forage, high percentage of fat, and good meat yield due to its abundant muscle mass" (Rossi, 1953: 1).

The need for defending the *Bruna* breed is easy to understand if we look at the number of animals of the two species at that time (Table 2)<sup>38</sup>.

**TABLE 2**  
**Numerical consistency of the *Bruna Alpina*/Brown Swiss and the Holstein-Friesian/*Frisona Italiana* breeds in Italy, 1942-79**

Year	Friesian/Holstein/ <i>Frisona Italiana</i>	<i>Bruna Alpina</i> /Brown Swiss	Total
1942	189,000	2,205,000	2,394,000
1956	1,086,072	1,845,278	2,931,350
1962	1,836,000	1,876,000	3,712,000
1970	2,958,000	1,479,000	4,437,000
1979	3,505,750	1,143,914	4,649,664

Source: Fusco (1990: 62).

Specialists of the sector proposed different solutions to improve the *Bruna* and make it more competitive with the Friesian. These solutions were initially the creation of bull stud

38. "According to the 1942 census, there were 189,000 Friesian cattle in Italy compared to 2,205,000 of the *Bruna* breed. However, it was after the last World War that the Friesian breed increased significantly. Already in 1956, a statistical survey reported 1,086,072 Italian Friesian compared to 1,845,278 *Bruna Alpina*, which then in 1962, increased to 1,800,000" (TARTARA, 1981).

semen collection centres, both in the mountains and plains, which were required for substantial improvement. Once bulls of good genetic ancestry were found (which was not easy due to the above-mentioned different opinions of mountain and lowland breeders), it was also recommended that they should be enhanced by setting up artificial insemination centres. The practice, however, was not sufficiently widespread everywhere:

“It is therefore clear that the method contributes significantly to solving the improvement of the cattle. However, [...] in the mountains the method is practically absent.

Therefore, it is necessary to set up bull artificial insemination centres in the Alpine valleys too, starting with a few males, among which one or two tested high-class bulls” (Consolini, n. d.: 74).

Indeed, *Bruna* breeders tried to make the breed more “attractive”. In 1956, in Bolzano, a special agreement was drawn up for setting up national herd books to replace of the previous provincial books. As a matter of fact, the latter enabled a selection based on the same criteria throughout Italy:

“The *Bruna* and *Frisona Italiana* Herd Books now safeguard precise regulations, which govern all aspects [...]: it can now be said that the work of selecting the *Bruna* and *Frisona* breeds finally has its own rules. While the provinces that had already established local Herd Books many years ago have now adapted to them, the regulations themselves have made it much easier to include those who entered the selection activity later and all those who want to enter it [...]” (Passerini, 1960: 9).

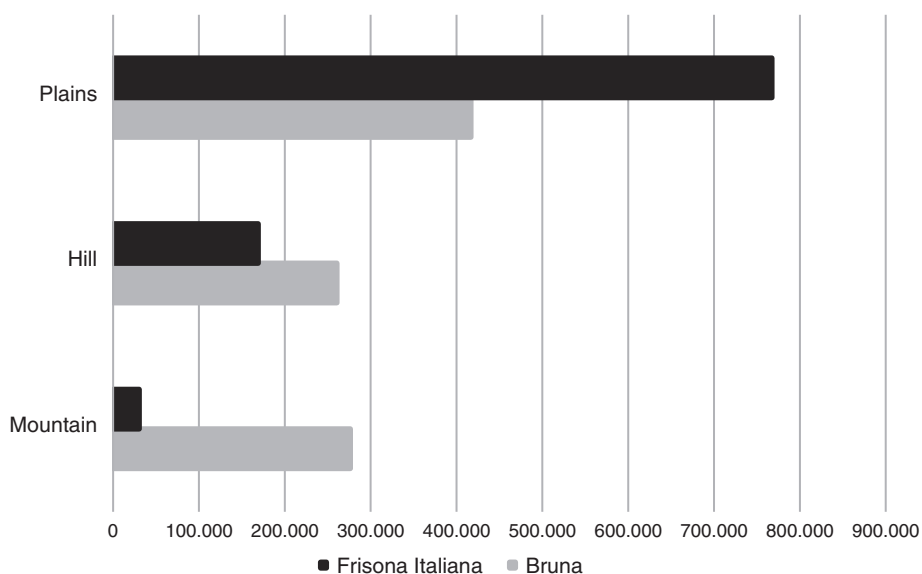
The data of the 1961 agricultural general census confirmed that the innovative stimulus for increasing the milk production of the *Bruna* breed did not achieve the desired results. Out of a total of 3,405,991 dairy cows in Italy, 953,646 were *Bruna*, surpassed, marginally, by 966,602 *Frisona*<sup>39</sup>. The same trend can be observed almost all over Italy: in mountain and hilly areas, the *Bruna* remained the most reared breed, while in the agricultural regions of the plains it was surpassed, often amply, by the *Frisona* (Fig. 5).

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39. It should be noted that the remaining cattle (1,485,743) consisted of an aggregation of all the other breeds. However, the census does not provide any disaggregated data on them and it is therefore impossible to assess exactly whether, where and to what extent the *Bruna* replaced these local populations.

Figures 6 and 7 confirm, once again, that the region most devoted to dairy breeds was Lombardy, and it was also where, more than in other regions, the battle between the *Frisona* and the *Bruna* was “fought”.

**FIGURE 5**  
**Cattle census by breed (*Bruna Alpina* and *Frisona Italiana*)**  
**by altimetric area, 1961**



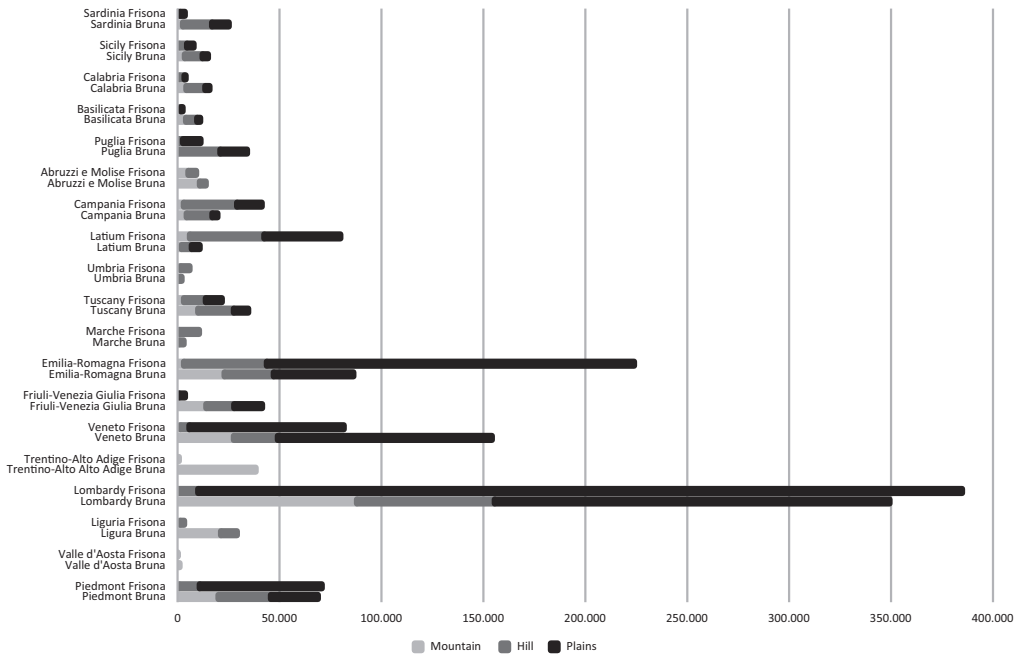
Source: ISTAT (1961).

Broadly speaking, we can observe that the other dairy breeds have much lower numbers than the two most popular ones<sup>40</sup>. The Frisona had already surpassed the Bruna Alpina breed, totalling 384,890 animals compared to 349,312 of the latter. However, as expected, it was in the plains that the Bruna gave way to the Frisona. In this area, in fact, there were 374,839 Frisona and 192,773 Bruna. The data are even more significant if we compare them with the figures of 1939, when in Lombardy there were 633,350 Bruna and only 22,440 Frisona. It is therefore clear that the Frisona breed was not successful in mountainous areas. In the mountain area of Bergamo, for example, there were 22,214 Bruna and only 28 Frisona. These numbers are comparable to those of all the other provinces<sup>41</sup>.

40. 147,453 out of a total of 881,655 dairy cows.

41. Brescia: 22,992 versus 88; Varese: 2,872 versus 215; Como: 15,981 versus 46; Sondrio: 23,689 versus 8.

**FIGURE 6**  
**Cattle census by breed (*Bruna Alpina* and *Frisona Italiana*)**  
**by altimetric area and region, 1961**



Source: ISTAT (1961).

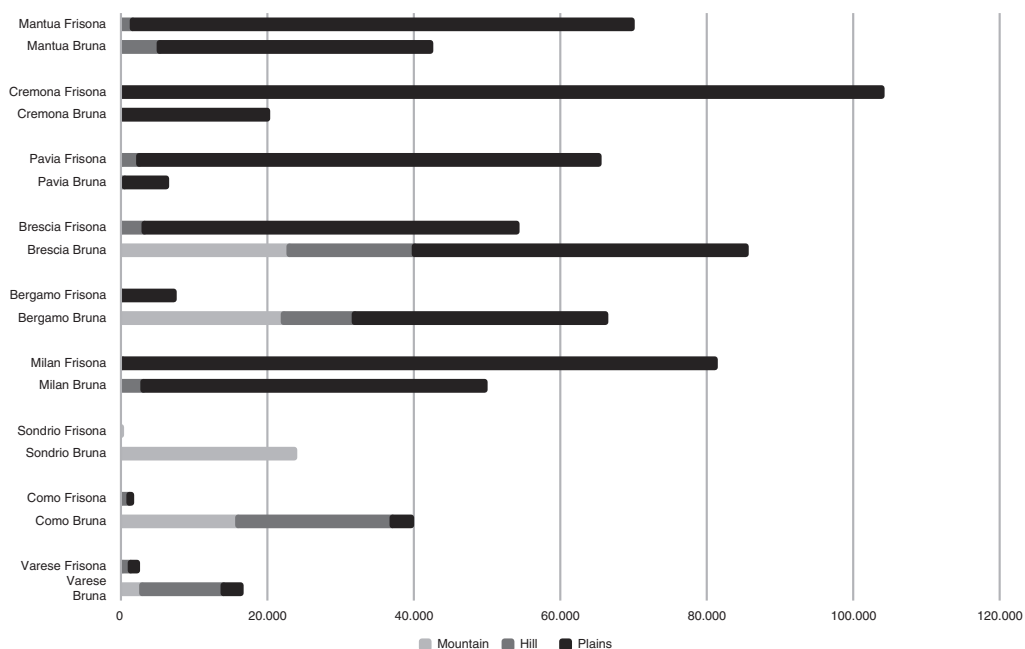
Therefore, the attempt to enhance the *Bruna* with a view to improving its milk characteristics did not achieve the desired effect. The advent of artificial insemination with frozen semen led *Frisona* breeders and their association to introduce replacement animals and their semen from the Netherlands (Friesian cattle) and, above all, from North America (Holstein cattle), thus further enhancing the ability of Italian animals to produce milk. The same approach was adopted by most of the *Bruna* breeders, who introduced Brown Swiss animals and semen. This strain was developed in the United States from the original Schwyz breed, which was more oriented to milk production, but unfit for meat production<sup>42</sup>.

42. Corti states that this introduction began in 1972, while Tonidandel claims that it had already begun in 1950. Corti's figure is considered to be more reasonable because, in 1950, artificial insemination with frozen semen had not yet been properly implemented, even on a European level. This occurred only in 1952 with the Second International Congress on the Physiology of Animal Reproduction and Artificial Fertilization, held in Copenhagen in 1952. See CORTI (n. d.) and TONIDANDEL (n. d.: 7).



This innovation led to an increase in the number of *Bruna*/Brown Swiss in the Apennine areas of Central-Southern Italy and on the Italian islands. However, the population of this breed did not stop decreasing in the areas most suited to milk production, to the benefit of the *Frisona Italiana*, leading to a critical reassessment of the importance of the *Bruna* in this area<sup>43</sup>.

**FIGURE 7**  
**Cattle census by breed (*Bruna Alpina* and *Frisona Italiana*)**  
**by altimetric area and in the province of Lombardy, 1961**



Source: ISTAT (1961).

Indeed, the new *Bruna*/Brown Swiss breed became unsuitable for traditional mountain farming. These highly milk-specialised animals, in fact, had to be fed in tie-stall facilities to achieve an acceptable yield:

43. “On the whole, the results obtained were quite discordant and many perplexities remained, especially as regards the profound changes of the ‘type’ of breed that arose and this was rarely compensated by an important production improvement in the crossbred animals.

The extensive and uncontrolled spread of the semen of American bulls [...] then began to cause serious concern to Italian breeders of the European *Bruna Alpina* strain bulls, who feared a worsening in their morphological structure. This deterioration would be particularly harmful to the cattle reared in the typical areas of the breed” (TONIDANDEL n. d.: 8).

“The cows weighed between 650 and 800 kg. Even a child can understand that such a weight made the breed unsuitable for reaching the hills and mountains, where the other cows of farmers used to be taken, to graze on a variety of superior quality grasses and herbs. If we force the Brown Swiss to climb up mountains, they run the risk of injuries. [...] This and other stress factors cause an increase in milk somatic cells and a deterioration of all cheesemaking parameters” (Corti, n. d.).

If this was a minor problem for the Friesian, which are bred on large farms in the plains using cattle feed, it proved to be an insurmountable financial obstacle for small mountain farmers. The “American-style” *Bruna*, in fact, was not adequately fed on local pastures and hay<sup>44</sup>, thus it was prone to health problems<sup>45</sup>.

On the one hand, this breed was unable to compete with the Freisian in terms of milk production while, on the other hand, breeders farming in hill and mountain areas preferred truly dual-purpose breeds. Therefore, this brought the total population of *Bruna* to 566,100 in 2001, with record lows in the plain areas of Lombardy<sup>46</sup>.

Although alternatives to the single-purpose Brown Swiss are still being examined<sup>47</sup>, it is clear that the heyday of the *Bruna Alpina* as the most important Italian breed, or at least as a competitor of the *Frisona* breed, has long since ended. This is due to several factors including an incorrect innovative stimuli which, aiming to achieve maximum production at any cost, led to disparaging the characteristics of an animal that was suitable for the most rustic areas of Italy.

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44. “[...] it is shown that the feed given to the cattle is not used in addition to grass, but to a large extent as a replacement. The cow, which normally eats 14 kg of grass a day (the quantities are expressed in ‘dry product’ [...]), once it is given 3 kg or more of feed, will reduce its consumption of grass, even drastically”. Also: “Compared to the specialised cows taken up to the mountains to suffer, paradoxically, their fellow cows, that live their entire lives in cow sheds, will be better off. Eating the same ‘daily single feed mix’ (UNIFEED) 365 days a year [...] they will adapt to this dietary condition and produce a mediocre quality milk, but, if nothing else, the consequences of stress caused by food changes and shortages of supply will be avoided [...]” (CORTI & MARIOTTI, 2007: 64-5, 67).

45. “On the basis of data collected in a large number of farms in Alta Valtellina (Upper Valtellina), we have personally observed that the BCS (Body Condition Scoring), a numerical index expressing the fattening state of the animal, falls dangerously below the value of 2 and still remains below 2.5 (energy deficit situation) after grazing in alpine pastures. Instead, at the end of lactation, it should rise to 3.5 in to ensure favourable conditions for the calving-lactating cycles” (CORTI, n. d.).

46. In Italy, in the same year, 700 animals were certified, of which only 589 were registered in the herd book.

47. With respect to the reintroduction in some mountain areas of the original Braunvieh, a type that is not crossed with the Brown Swiss, I have consulted Corti.

## 6. CONCLUSION

In this article I have sought to clarify how, when and why the *Bruna Alpina* was outclassed by the *Frisona Italiana* cattle breed, in the attempt to improve the Italian dairy sector. The data show that, at least until the end of the 1950s, the *Bruna Alpina* was still preferred in most of Italy. The situation changed drastically in the 1960s, when the *Frisona Italiana* was preferred to all other cattle breeds. This raises some interpretative problems which need to be addressed, but it is possible to try to identify some reasons for this transition. Certainly, the inadequate technical conditions in Italy that would have allowed a real improvement of the breed with the American semen were a crucial issue. Indeed, with the introduction of artificial insemination with frozen semen, the situation changed dramatically (Marigliano, 2017-18)<sup>48</sup>. However, this is not the only reason. *Bruna* breeders, in fact, could also have profited from innovative cutting-edge technology and used Brown-Swiss semen to improve their cattle. However, many farmers, especially in the plains, decided to stop raising the breed. Undoubtedly, most of them opted for the *Frisona* due to its high milk yield, which was higher than that of the *Bruna*. This, however, was widely known, even before the Second World War. Domestic demand, especially for milk and cheese, in the post-war period<sup>49</sup> was the main reason why farmers were interested in Friesian cattle. With a much larger domestic market to serve, breeders focused their attention on more productive breeds without fearing lower profits due to large amounts of unsold products.

Another issue that had previously deterred the introduction of *Frisona* on a large scale was its great need for feed in order to be able to produce large quantities of milk, as reported by Consolini<sup>50</sup>. All the innovations in the agricultural sector analysed by Cavazzoli (2002), however, made forage production for lowland farmers increasingly cheaper, thus further increasing sales and profits. However, all this was pointless for the *Bruna* breed, which needs much less food than the *Frisona* and whose yields were not directly

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48. This technique was endorsed at the Second International Congress on Animal Reproduction Physiology and Artificial Fertilization held in Copenhagen in 1952, where researchers demonstrated the possibility of freezing semen with liquid nitrogen and contributed to the success of this practice (BONADONNA, 1947: 1, 2, 7).

49. This was so important that the government considered the livestock sector to be strategic, as demonstrated by a number of laws enacted during the period: Law no. 1009 of 25 July 1952 on the central control of insemination, meaning that it could only be carried out by veterinarians authorised by the Ministry of Health; the decree of July 1954 laying down rules for the duty-free import of pedigree animals for breeding thanks to a certificate issued by experts appointed by the Ministry of Agriculture; the official introduction, on 24 June 1956, of the National Herd Book of the *Frisona Italiana* and *Bruna Alpina* breeds. See MARIGLIANO (2017-18).

50. See note 29. On this topic, see also THEUNISSEN (2008).

proportional to the feed eaten by the animals. Therefore, breeders attempted to make the *Bruna Alpina*, which was previously fairly good for beef and milk production, perfect for the difficult climate conditions in the hills and mountains, a “top-class milk producer” to compete with the *Frisona Italiana* thanks to the Brown Swiss semen. This, however, distorted its characteristics, making it unsuitable for both mountain areas and the plains.

In conclusion, all these factors led to the “supremacy” of the *Frisona Italiana*, although taking into consideration the widely differing territories in Italy. The *Bruna Alpina* continued to be bred in hilly and mountainous areas, but most farmers who were more focused on industrial livestock production chose the *Frisona* breed.

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