

THE HUNGARIAN

---

GREY

---

CATTLE BREED

---





# THE HUNGARIAN GREY

---



---

## CATTLE BREED

---

A technical publication

Second revised edition

*Subsidised by Ministry of Agriculture  
and Rural Development  
FVM*

BUDAPEST 2004

Authors:  
Imre BODÓ, István GERA and Gábor KOPPÁNY

Translation:  
Béla BORSOS

Lector:  
György KOVÁCS



Published by:  
ASSOCIATION OF THE HUNGARIAN GREY CATTLE BREEDERS  
(A Magyar Szürke Szarvasmarhát Tenyésztők Egyesülete)  
Budapest, 2004

Printing: PASSZER LTD, Budapest  
Book design & typography: Katalin GYULAI

## CONTENTS

---

<i>Introduction</i>	1.
	page 7
<i>History of the Hungarian Grey cattle</i>	2.
	page 9
2. 1. The origin of the breed.....	page 9
2. 2. The age of prosperity.....	page 10
2. 3. Turkish times.....	page 11
2. 4. Decline.....	page 11
2. 5. The breed issue.....	page 12
2. 6. Breed districts.....	page 14
2. 7. The years after World War I.....	page 15
2. 8. The period after World War II.....	page 17
2. 9. Famous stock-farms with more numerous heads of cattle.....	page 21
2.10. The situation of the breed nation-wide (1970–1990).....	page 25
<i>Relatives of the Hungarian Grey cattle</i>	3.
	page 27
3. 1. Noble aurochs-shaped cattle with long horns.....	page 29
3. 2. Degenerated primitive cattle having lost their identity.....	page 33
3. 3. Improved breeds of Podolian origin.....	page 40
3. 4. Relatives in other distant countries and far off areas.....	page 42
<i>Conformation of the Hungarian Grey cattle; types within the breed</i>	4.
	page 46
4. 1. General considerations.....	page 46
4. 2. Description of the breed conformation.....	page 48
4. 3. Types.....	page 61
4. 4. System of judgement.....	page 65

<i>Economically important characteristics of the breed</i>	5.
	page 67
5. 1. Milk production .....	page 67
5. 2. Evaluation of the Hungarian Grey cattle in specialised beef production.....	page 70
5. 3. The Hungarian Grey cattle as draught animals.....	page 77
 <i>Breeding work</i>	6.
	page 79
6. 1. Selection goals in the breeding of Hungarian Grey cattle.....	page 79
6. 2. The formation and role of lines in the breeding of the Hungarian Grey cattle.....	page 82
 <i>Utilisation of the Hungarian Grey cattle</i>	7.
	page 92
7. 1. The Hungarian Grey cattle as a gene reserve .....	page 92
7. 2. Beef production in pure-bred stock.....	page 94
7. 3. Beef production by using commercial crossing.....	page 98
7. 4. Marketing possibilities.....	page 102
 <i>The herd-book registration</i>	8.
	page 106
8. 1. Identification, individual marking .....	page 106
8. 2. Collection and processing of breeding data.....	page 107
8. 3. Collection and processing of performance data .....	page 108
8. 4. Other data, judging conformation .....	page 113
8. 5. Herd-book categories .....	page 113
 <i>Management technology</i>	9.
	page 114

Contents

<i>Association of Hungarian Grey Cattle Breeders (Magyar Szürke Szarvasmarhát Tenyésztők Egyesülete)</i>	10.
	page 116
<i>The future of the breed</i>	11.
	page 119
<i>Bibliography</i>	12.
	page 121



## INTRODUCTION

1.

---

The breed of Hungarian Grey cattle has once been very important in the economy of the country, and it was a distinguished export good driven on four feet to foreign market. It has been reckoned with as a peerlessly good breed to produce draught animals and oxen.

When nowhere was need any more for oxen, the breed was condemned to disappear by cross breeding or replaced with other breeds. The collaborating and not entirely dutiful activity of a few enthusiastic experts (civil servant, agricultural engineer and herdsman) was necessary for the sustenance of the breed up to the point, when the management of the Hungarian land use policy and the government administration has got to the revelation and the acknowledgement of the importance of the conservation of rare breeds as gene reserves, as a cultural heritage for the distant future. And indeed, *144/1 Morgó*, the illegally reared breeding bull was still in full service, when the respective bureaucrat, who had given the most forceful order to phase out the Hungarian Grey cattle, was not in office any more.

Indeed, the true value of the ancient breeds was already recognised by the experts in the sixties in Hungary and thus we can proudly state that our country is among the first in conservation efforts of gene reserves. Today the maintenance of genetic diversity is an important trend in the animal breeding of the world both in science and in practice and as a matter of fact it is one of our most successful activities in the fields of animal husbandry and livestock improvement during the second half of the twentieth century. Since the nadir the Hungarian Grey cattle have gathered strength and their number grew to the level where there is reason to believe that even our grandchildren will see this attractive and noble breed of cattle.



## HISTORY OF THE HUNGARIAN GREY CATTLE

2.

### *The origin of the breed*

2. 1.

In the last century the opinion still generally prevailed that our ancestors brought the Hungarian Grey cattle with them at the time of the Hungarian conquest (HANKÓ 1940, 1943, 1952).

Recent archaeological research has proven otherwise. According to BÖKÖNYI (1961), based on the bone findings of the excavations, small, brachyceros-type cattle lived in Hungary before the 14th-15th centuries, which were widespread all over Europe. BÖKÖNYI does not find authentic the date of HANKÓ either. According to him it is probable, that these cattle got into the country with the Cumanian or some other, later immigrants and as an economically more suitable breed it quickly displaced its predecessor. This is why cattle breeding becomes a significant economic and trade factor just from this time on (that is, from the 14th-15th century). Other authors also acknowledge the possibility that fresh blood have arrived with the Cumanian.

Though the research of BÖKÖNYI has uprooted our concepts so far believed to be certain on the origin of the Hungarian Grey cattle, but it did not give an accurate answer to the question.

A newer theory is the concept of JANKOVICH, who thinks that the domestication of the Hungarian Grey cattle took place right here in the Carpathian basin during the rule of the kings of the Árpád-dynasty. It is a proven fact that at that time in our woods the aurochs still lived in great numbers. It must have been a tasty meat for it was hunted intensively, so much so, that the term for the occupation as aurochs-hunter (venator buorum) also existed in the documents of the time. It is very important though, that suddenly another occupation name appears, which refers to the hunting of aurochs calves (venator bubalinorum). According to JANKOVICH (1967) it makes sense to give different names for hunting adult and young animals if the hunt was made with different means and for different aims. His conclusion seems to be logical that our forefathers might have captured the calves of the aurochs using nets or traps in order to tame and domesticate them. Though we do not have any direct evidence for this and archaeologists, pre-historians as a rule do not like the theory, yet it cannot be dismissed as impossible. We have to agree however, that until the aurochs lived here and it really was the ancestor of cattle belonging to the same species, then spontaneous cross breeding must have been occurring relatively often under the conditions of the time. (A similar crossing of the wild

boar and the domesticated swine occurs sometimes even today.) As long as the cattle were feared and the selection aim was the small bodied animal, crossbreds were not kept. However, as soon as the need arose to exploit great pastures and to drive the animals on four feet on lengthy travels, these must have become the most valuable animals and during a few generations the Hungarian Grey cattle breed was created.

As for the origin of the breed there are three different theories:

- it was brought along with our ancestors,
- it has got here with a subsequent surge of the migration period
- the breed is a result of the local medieval domestication

Science has not arrived at a final decision on this issue. However, if we compare the three theories, actually we cannot find an incompatible contradiction among them. It is quite possible, that our ancestors also brought some of these cattle, so few, that archaeologists have not yet found them. They might also have come with subsequent surges of immigrant Cumanian and Pecheneg, or that of Balkan refugees settling in from the South. This assumption is supported by the findings proving that such kind of cattle with long horns lived indeed around the Mediterranean. During the period after the conquest and later, in the time of the Árpád-dynasty, the possible role of the aurochs cannot be excluded either.

There is a hope that science will keep providing us with interesting data in this field to answer this fascinating question.

---

*The age of prosperity*

2. 2.

Regardless of the origin of the Hungarian Grey cattle in the Carpathian basin, it spread quickly and became dominant in the 14th and 15th century, soon reaching the standard status of a popular export item much in demand.

During the medieval a great proportion of the surface area of the country has been wetland and marshy meadows. Thus there was a possibility to raise an extremely great number of cattle under entirely extensive conditions. There were enormous cattle herds everywhere, kept in the open all year round.

The “long horned young bullock with its martial bearing, fiery and weather-hardened” (RUISZ 1895) driven from the “Puszta” of the Great Hungarian Plain to Western Europe ranked indeed among the world trade marks. This breed was suitable for the task that after being driven for several hundred kilometres on four feet it should arrive in good meat quality to the distant abattoirs. Wide driving routes led in every directions. The pri-

mary market was Vienna, but the Hungarian Grey cattle got as far as Nürnberg, Strassburg, and Venice as well. In Moravia the most famous was the market at Auspits (FRANCÉ 1943).

The great exporting period lasted from the 15th to the 18th century, the most significant being in the 17th century. The yearly average was estimated to be 100,000 heads of cattle (ÉBER 1961). It is typical for the great numbers of animals that in the mid-15th century a citizen of Debrecen named Gáspár BÍRÓ had approximately 10,000 heads of cattle (WELLMANN 1926).

Of this enormous export a substantial income arose. The income was mostly pocketed by cattle traders and, through customs and duties, by the kings. It is known, that cattle export duties played a significant role even in the state budget of King Matthias (HÓMANN–SZEZFŰ 1928).

---

### *Turkish times*

2. 3.

The devastation brought by the Turkish caused immense damages. This was not that important in the field of cattle breeding, however, as it was in other fields of economy. The utilisation of the vast barren fields formed during the wars was best possible by using extensive cattle husbandry there. It was partly the cattle breeding which sustained the folks in town and it opened up the opportunity for the creation of mighty wealth. It is known, that the trading towards the South was mostly in the hands of the Zrínyis. Tamás Nádasdy was already a palatine when he still bought plain cattle and having fattened them on grass sold on the Viennese. The asset of the Thökölys was also based on their cattle trading.

The cattle plague of 1598 caused substantial damages, but the stock survived in a relatively good state.

According to historic research (HÓMANN–SZEZFŰ 1928) 30 % of the income in royal Hungary originated from the thirtieth duties, of which a decisive proportion derived from cattle export duties.

---

### *Decline*

2. 4.

The Viennese court strove for acquiring the profit of the cattle trade. In 1622 the Landverleger Compania was formed and it had the monopoly of cattle export from Hungary, thus taking away the income of the Hungarian cattle traders as well. The monopoly situation provided for the pressing

down of inland prices. This, in turn became a barrier to breeding activities. Though this special company has not operated for long, yet the efforts of the Viennese court became permanent.

The situation was further aggravated by the constant wars. Liberation from the Turkish oppression took a serious toll from the cattle stock as well. In 1695 the Emperor's officers reported to the Reichskriegsrat, that Debrecen has no cattle any more, nor has Nagyvárad any, only in Transylvania is there some left (FRANCÉ 1943).

The last cattle market in Nürnberg took place in 1713.

Slowly, changes came along in the methods of animal husbandry as well. The Europe-wide "polished" agriculture of the enlightenment period did not remain without an effect on our country either. Beside a broad scale development of grain crop production on cultivated fields the possibility of feedcrop production emerged as well. A more intensive husbandry on the other hand suggested the application of the proper breeds.

The new role for the Hungarian Grey cattle proved to be the production of draught oxen. It was excellent for this purpose, but this way there was a need for substantially lower numbers, than if it was not for the competition from the side of milk and meat production.

Referring to the cattle plague, wars and market situation (more favourable for wool) experts reported on the qualitative and quantitative decline of the Hungarian Grey cattle stock in the 19th century (ÉBER 1961).

---

*The breed issue*

2. 5.

The new conditions of agriculture demanded more arable land and did not permit for the utilisation of the great outspread pastures and grasslands. Following the river regulations much land became suitable for ploughing and cultivation. At the same time cattle rearing had to meet the requirement to provide great income with small numbers. This seemed to be best fulfilled by milk production, as the citizenship of the developing towns and cities proved to be a stable market for this product.

A professional debate was launched on the issue considering the Hungarian cattle, whether they are suitable for economical milk production or the problem should be solved by the importation of a new breed.

In 1859 Róbert CZILHERT states, that cattle breeding can only be cost effective through milk production. According to him selection for milk production demands to sacrifice draught traits and wantlessness. He also predicts the perish of draught cattle referring to the expensive way of employment of servants.

ZLAMÁL (1867) and VÉGHY (1874) find that meat production and yoking were more important and according to them: “our selected breed meets all the requirements to be demanded from any kind of cattle”.

GOTHARD (1884) maintains that yoking and dairy production were important. There were also some experts, who wanted to import the “buttery” cattle of the Island of Jersey in order to put an end to the breed question (ÉBER 1961).

Apostles of the domestic breed (EGÁN 1887, KODOLÁNYI 1870) advertised their belief that milk production was not a question of breed but that of individual characteristics. Beside ZLAMÁL (1867) the following authors expressed their opinion that the proper way was the improvement of the Hungarian cattle: PETHE, NAGYVÁTHY, MAGDA and KORISMICS. Opposing them TORMAY and KENESSEY denied the possibility, that the goal could be realized without the loss of the existing traits (ÉBER 1961). There were some, who were afraid of the diminution of the front quarters (PIRKNER 1906).

There are many, who call the attention to rearing conditions as well (ZLAMÁL 1867, GRASSELLI 1891). According to SPERKER (1911) it is not a new breed, which is needed, but breeders' work and feedstuff. Quoting the statement of JAKAB (1905): “...it is not enough just to import a good breed, it must also be fed according to its needs, otherwise as you can see at many places in our country, all the good qualities would dry under its hide”.

The possible loss of the draught traits was considered to be a great price since even sugar factories in Bohemia were keen to import Hungarian oxen from mostly Transylvania (EGÁN 1890, SPERKER 1911). The slogan appears: “Draught cattle to the West, breeding cattle to the East.” (JAKAB 1905, EGÁN 1890). The excellence of the oxen of the breed is not debated by anyone, yet there were some who already at the end of the last century preferred the Simmental oxen for its better fattening ability (MAGYARI 1961).

KOVÁCSY (1901) keeps it suitable on the Great Hungarian Plain and also in Transylvania, but in the other parts of the country he considers the introduction of another breed to solve the problem. Some—very properly—recognised the fact, that depending on the natural and economic conditions all breeds might have their reason for the existence (BALOGH 1909) and the breeding of the Hungarian Grey cattle is bound to poor quality grasslands and the production of cereals. HEGEDŰS (1891) expects that the cultural development of extensive herding will increase the profitability of breeding Hungarian Grey cattle, though he does not exclude the selection for milk production, either. Gábor FELSZEGHY (1914) acknowledges the reason for

existence of both breeds and hopes for the final solution of the problem by establishing breed areas.

MONOSTORY (1906), referring to the only positive example of successful selection for milk production in Transylvania, hopes yet another one thousand years for the breed. ROSTAFINSKY (1912) and PIRKNER (1916) however, do not believe in that and predict the demise of the Hungarian Grey cattle.

According to JUHOS (1900) beside unfavourable economic conditions incompetence of the breeders also contributed to the decline of the breed. According to him one has to cross, since there is not enough time for the improvement of purebred stock. When transport conditions enable producers to market the milk, it is too late to begin improvement.

Miklós NAGY, looking back to this time in 1942 admits, that there were some Hungarian Grey cattle stocks, which achieved the average production level of Hungarian Simmental cows of the time, without having lost the character and conformation of the breed. Yet, he can also refer to the Transylvanian examples only.

Apparently, the experts clearly saw that in order to maintain the Hungarian Grey cattle, to select for meat or milk production would be necessary. Disregarding a few isolated stocks however, nothing happened. The diminishing Hungarian Grey cattle stocks were kept alive by selling their oxen. As for the change in selection trends, it was more easily done by cross-breeding and the change of the breed than by decades long and uncertain improvement. In 1884 all the Hungarian Grey cattle breeders had the goal of production and sale of oxen in their minds ORDÓDY (1884).

---

*Breed districts*

2. 6.

Since the 1880s in Hungary the breed district scheme was in effect. According to this in the middle of the country the breeding district of the Hungarian-Transylvanian character has been formed. The Western, north-western and Northern parts were assigned for the red Simmental cows (Kuhlander, Berner and Simmentaler) for the more abundant possibility to produce feedstuff there. As for the district of the Braunvieh cattle, it spread to the North from the county Trencin, interrupted by the Szepesség up to Máramaros. In the South there was not an assigned breed everywhere. In the South of Transylvania in order to make smuggling more difficult, an effort was made to introduce the Pinzgau cattle. The boundaries for districts of the individual breeds were not always very distinct (TORMAY 1885).

This scheme was swept away by real life. The Pinzgau cattle spread very slowly, the Braunvieh cattle could not take a foothold on the assigned territories either, while the Simmental, the red Simmental cattle reproduced everywhere.

---

*The years after World War I*

2. 7.

At this time agricultural work carried out with tractors begins to overtake. Many estates have wound up their Hungarian cattle herds because less oxen were needed.

There were some, who kept urging to increase the production of the Hungarian Grey cattle (MEISSNER 1926). MATTESZ (1927) in Mezőhegyes suggested the establishment of a Hungarian Grey dairy stock. Some experimental milking took place, but the only selection objective in the twenties remained the production of draught oxen (WELLMANN 1926), that is the case of before forty years remained unchanged.

In 1927 WELLMANN dealt with the essential questions of cattle breeding on the columns of the journal "Köztelek", and among these issues nothing was mentioned on the problems of breed. It is obvious, that the question for the expert who had a clear insight was already decided for the Hungarian Fleckvieh.

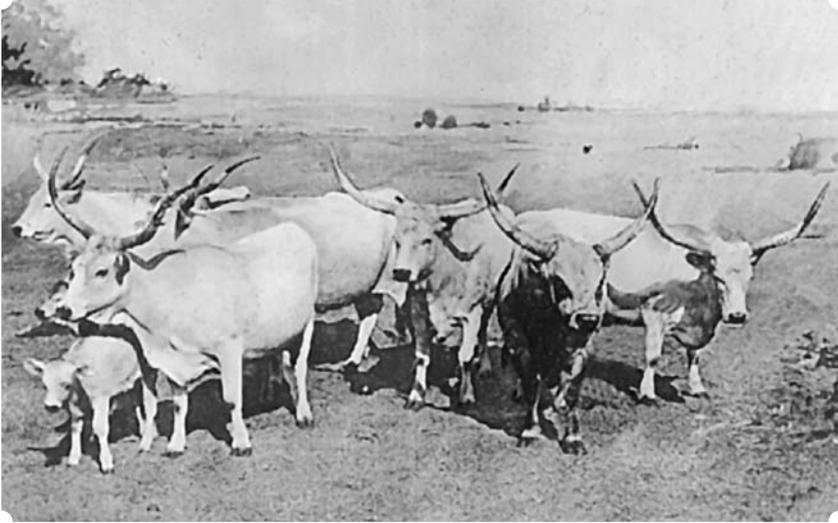
The economic crisis beginning from 1929 increased the role of the oxen in agriculture once again. Articles appeared showing the economic efficiency of yoke over machine (BENKE 1932, 1935). As a special advantage, it was emphasised that there is no need to pay for maintenance, while fuel and spare parts for machines require massive cash expenditures.

Breeding work became organised as well. On the 21th of March, 1931 the National Association of the Breeders of Hungarian Cattle (Magyar-marha Tenyésztők Országos Egyesülete) was founded. Its task was to provide guidance in the breeding work and to organise herd-book registry. There were some efforts made with regard to milk production, though experimentally only (BATTHA 1935).

By 1939, 312 bulls, 4,336 estate and 4,835 small holders' cows were registered in the herd-book. In order to track down the origin accurately and to ensure pure bred status of the breed in vernacular stocks, 50 head-herds were established in the Hortobágy and a bull rearing farm operated at Álomzug.

The prosperity was justified by the Hungarian Grey cattle stock displayed on the breeding animal fairs organised year by year. During the 1934 fair for example, 81 heads of bulls were sold for good prices. In 1934 a

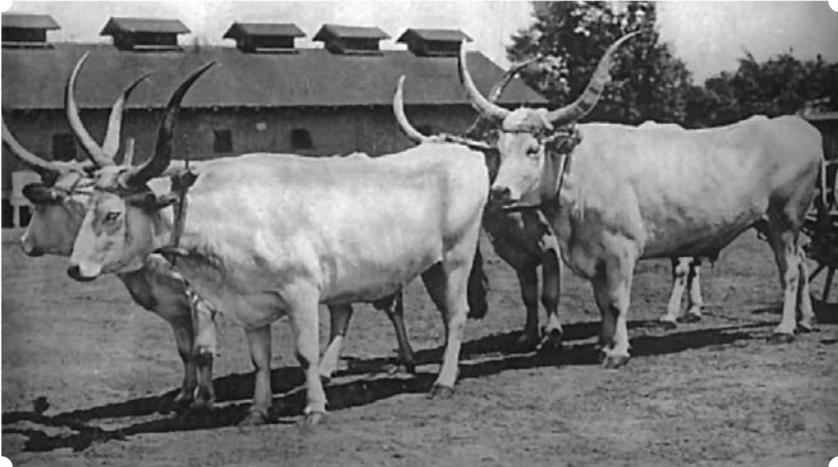
The Hungarian Grey cattle breed



*Hungarian Grey cattle herd of Mezőhegyes state estate from the twenties*

Ministry of Agriculture decree called attention to the breed and to a certain minimal extent the restoration of its breeding district was also planned.

In his articles, Arisztid TÓTH (1931, 1935)—maybe a little beyond the limits of reality—makes an attempt to serve the cause of spreading the



*A team of four oxen, Füzeogyarmat (1928)*

Hungarian Grey cattle again. Gáspár GEIST (1925), however, claims that the Simmental would cope with the Great Hungarian Plain just as well, if the appropriate conditions are provided for it. According to VUCHETICH (1934) there is a possibility to select excellent cattle with triple utilisation based on the Hungarian Grey cattle. Gyula BENKE (1932) is certain that the breed will ever have a role in the Tiszántúl.

Zoltán CSUKÁS (1943) has also dealt with the problem of the Hungarian Grey cattle. He cited as examples the Podolian breeds of Italy, which became the basis for excellent modern cattle breeds. According to him the great variability and plasticity represents significant possibilities from the point of view of selection for beef.

KERÉKGYÁRTÓ (1941) and MAGYARI (1941) dealt with the biometrics procession of the measurements of the Hungarian Grey cattle. They concluded, that under appropriate conditions individuals of the Hungarian Grey cattle could easily achieve the same measurements like that of the Simmental. This was proven by data of exhibitions and fairs, where many Hungarian Grey steers were present, which showed greater weight and body size, than the majority of the Simmental animals displayed.

András PIACSEK (1933, 1938) was the only one among the experts of this era, who did not expect results in the maintenance of the breed from milk production or competition with the Simmental breed cattle, but from reasonable extensive cattle-herding. According to him the spreading of the Simmental was justified, but there are some areas, which can be best exploited by the herded cattle in the future as well. It was also him, who brought the news on the extinction of the famous Transylvanian stocks.

In 1934 the first Maremman import took place, which was followed by several others somewhat later. Breeders of the day took the Maremman for a variety of the same breed and expected a lot from it, mostly more voluminous hocks, wider and more muscular hindquarters and thighs. Initial results were promising but World War II did not allow for a widespread application of them.

---

*The period after World War II*

2. 8.

At the end of the forties there were some 5 % Hungarian Grey cattle left in the cattle stock of the country. The more valuable estate stocks however, ceased all, and even the small holders stocks were mixed. Thus nothing has been left from the results of the booming breeding work of the former period. Starting state farms must have to begin with rather mixed, purchased

stocks. The official selection goal, recorded in standards, emphasised fattening capacity and milk production. Standards, naturally, referring to the backwardness of the breed, were low (Table 1).

Table 1  
*Conditions for categorisation of Simmental and Hungarian Grey cows*

	Class II		Class I	
	milk (kg)	fat (%)	milk (kg)	fat (%)
Simmental	2,500	3.7	5,000	3.8
Hungarian Grey	1,300	4.2	3,200	4.4

Certainly the Hungarian Grey cattle could not be a worthy rival of the Simmental under the conditions of modern economy. In some of the state farms cows were milked in greater numbers, thus it was possible to get credible data on the milk producing ability of the breed. Actual results are accounted for in the chapter dealing with economically important characteristics. Grey cows produced significantly less than their Simmental counterparts. By the end of the fifties, milking of Grey cattle was abandoned everywhere in the country. In the small holder stocks as well, modern breeds replaced the Grey cattle more and more.

János HORVÁTH (1955,1958), the veterinarian of Kenderes village tried in his articles to suggest the beginning of breeding work referring to an elastic genetic basis and endurance, to set up 50 head-herds, but life went beyond all this by that time.

The Hungarian Grey cattle stocks have been usually replaced by Simmental, and in certain parts of Szabolcs-Szatmár county by a crossing of the Brown Swiss and Costroman breeds (for a few years, then Simmental follows here as well).

In 1964 the last Hungarian Grey community bull was slaughtered in Hajdúnánás (*Bandi* from the Ohat stock).

Table 2 shows the decline of Hungarian Grey cattle in the percentage of national stock, while Table 3 displays the state of pure bred stock in the autumn of 1966. Data related to community breeding have been obtained by personal visits to some of the settlements once breeding Hungarian Grey cattle. Data from state farms are accurate (1st of October, 1966). The number of calves do not include crossbred animals.

Table 2

*Hungarian Grey cattle in % of the national cattle stock*

Before World War I		Between wars		After World War II	
<i>year</i>	<i>%</i>	<i>year</i>	<i>%</i>	<i>year</i>	<i>%</i>
1870	99	1924	18.0	1946	5.0
1880	90	1931	14.0	1957	2.5
1884	80	1934	13.0	1967	0.005
1895	66	1935	12.5		
1905	41	1936	12.5		
1908	33	1937	12.0		
1911	31	1938	11.5		
		1939	10.9		
		1940	11.4		
		1941	9.3		
		1942	9.1		
		1943	8.5		

In 1966 community breeding of Hungarian Grey cattle was restricted to household farming. Around Eperjeske, Lónya, Tiszamogyorós there were 3-4 cows per village, while around Kísar, Nagyar, Panyola, Tarpa this number was 8-10 in the community herds. In Hajdúnánás, Tiszacsege, and Kunmadaras only a few are left. It was mostly elderly farmers who kept Hungarian Grey cattle, who did not want to part from their beloved, customary animals. Some wanted to cover the costs of their own funeral from the sale price of their last Hungarian Grey cattle. There was no replacement, even the illegally kept bulls have got to the slaughterhouse after a few years. The quality of the stock, evidently, was very much mixed at this time. From the cross-breeding however, some calves were born with excellent conformation, beef characteristics, mostly from Braunvieh bulls.

After the war several state farms had Hungarian Grey cattle herds. Of these three remained: the stocks of Hortobágy State Farm, Középtisza State Farm and Városföld State Farm. As a matter of fact, all Hungarian Grey cattle of today take their origin from these three stocks. Remnants of the Hungarian Grey cattle stock of Töviskes and Izsák were taken over by the Hortobágy State Farm, while cows of Mezőnagymihály and Hosszúhát were transferred to the Középtisza State Farm.

With regard to the number of animals the worst came following this. Private stocks all have ceased to exist and only the three state farm herds, merely 6 bulls and some 200 cows transmitted their genes to the stocks of today. This is what in genetics is called the bottle neck phenomenon, provided that the number catches up later on. This is what happened in the case of the Hungarian Grey cattle.

At the beginning of the 1960s the politically heavily supported selection trend was the cross-breeding with the Costroma breed. Undeniably crossings with the Costroma cattle has improved the milking capacities of the Hungarian Grey cattle and there were some really good milking cows among the crossbreds, yet it was obvious at the time already, that this construction was not competitive among the dual purpose breeds with the Simmental. The Costroma cross-breeding took place in the Hosszúhát State Farm, but from 1960 onward it was illegal to mate Hungarian Grey bulls in the Hortobágy State Farm as well. Therefore the breeders working on the state farms those days simply sabotaged these instructions and in the very moment as it was possible, they officially decided in the National Centre for State Farms to maintain the breed.

According to the central stock breeding resolution passed in the autumn of 1961 merely 200 cows should have had to be kept pure-bred. Based on our knowledge of today, this is very few. It must be considered however, that the notions of gene conservation and the value of genetic diversity have not existed at the time. The state farm resolution which declared that the best 100-100 cows of both the Hortobágy State Farm and the Középtisza State Farm should be included in pure-bred breeding programs, preceded by more than ten years the establishment of the famous British institution, the RARE BREEDS SURVIVAL TRUST. Nowadays this fact is appreciated quite positively world-wide and therefore Hungary has got onto the cutting edge with regard to the conservation of gene reserves (GRÜNENFELDER 1994).

By 1963 and 1964 there were three herds containing 310 Hungarian Grey cows to be maintained through subsidies at the cost of the profit of the state farms (according to the first official survey there were 180 cows at Hortobágy, 80 at Középtisza, and—after some fight—50 heads of cows at Városföld).

Thus we can say, that the survival of the breed is to be thanked to those breeders, state farm managers and to at least equally well to herdsmen, who insisted on this breed even at times, when its breeding did not seem to be profitable or cost effective to neither state farms nor individual breeders. Without them there would have been nothing to be conserved at the time when conservation of native breeds was declared officially.

Table 3  
*Hungarian Grey cattle numbers in autumn 1966*

	breeding bull	cow	young	progeny of 1966	total
Szabolcs-Szatmár county	–	120	10	–	130
Hajdú-Bihar county	–	50	5	–	55
Szolnok and Borsod counties	–	30	5	–	35
Hortobágy S.F.	7	165	128	90	390
Középtisza S.F.	3	79	73	63	218
Városföld S.F.	2	26	50	20	98
<i>Total:</i>	<i>12</i>	<i>470</i>	<i>271</i>	<i>173</i>	<i>926</i>

The Ministry of Agriculture adapted a resolution for the maintenance and subsidisation of the autochthon breeds on the 14th of May, 1973.

From the seventies of the last century there was a slow progress to be seen. Numbers of the state farm herds stabilised and their state of health was settled. Two of the agricultural co-operatives established herds on their own. In the last few years some private breeders also grew interested in the breed. It seems that after years, when the breed was merely considered as a gene reserve by most of us, some consider the possibility of competitiveness of this breed in cheap extensive technologies. The next years and decades to come might give the answer whether these expectations prove to be true.

### *Famous founder stock-farms*

2. 9.

History of the sixties and seventies should begin with the story of the three state farms which the entire Hungarian Grey cattle stock is presently based on.

#### Hortobágy

Between 1950 and 1954 a farm was set up with purchased cows at Kecskés, belonging to the Ohat State Farm. The farm has bought 521 cows and 15 bulls. Cows were milked during 5 years, and the aim was to produce bulls with ability to perform great milk yields, at the same time keeping the yoking traits and favourable beef characteristics under extensive conditions. It

turned out soon that this is not possible to follow as a selection goal today, because the Hungarian Grey cattle are not competitive with other breeds.

After this, based on the promising experiments of MAGYARI (1958) at Hosszúhát the period of Costroma crossings followed. The task of the farm was to produce Costroma Hungarian F<sub>1</sub> heifers for itself and the Hosszúhát State Farm. Despite the instructions, however, each year a few pure-bred Hungarian Grey heifers or bulls were born. Though no bulls were reared and put in use between 1956 and 1961, continuity could be solved by a few young bulls spared in 1961. By the middle of the sixties it became clear, that the Costroma crossing was not competitive compared to pure-bred Simmental cattle therefore the crossings were abandoned entirely.

Since 1962 it is a pure bred stock. The state farm has reproduced the number of Hungarian Grey cows above 500 heads by the mid-seventies. Exemption from tuberculosis posed a problem. The work began in 1979 by separating the calves from their mothers and rearing them with the drinking method. Even the colostrum was provided by the Mezőhegyes State Farm.

In 1994 the state farm was abolished and as the successor, a Non-Profit Trust of Gene Conservation manages the herd. The cows, which are again more numerous than 700 are divided into 200-cow herds. The so called Golden Herd includes the most beautiful cows with immaculate conformation. The selection of white horned, massive animals exempt from faulty conformation is considered to be the ideal way of doing this. As for genetic diversity, the Diamond Herd is even more valuable, where all the conformation traits are conserved which occur in the stock. This herd is not homogenous, but as for maintaining gene reserves, this represents the greatest value. The third herd, called Showy Herd is essentially a reserve in gene conservation and it is used for different crossings carried out by the farm.

The fourth one is also a genetic diversity herd.

At Tornydomb year by year cowboys' competitions and young bull fairs are organized. The organic beef production led by the Trust is developing.

#### Tiszaigar (former Középtisza State Farm)

It was formed in the fifties, also from purchased animals. There were cross-breeding here as well and it is also a stock herd since 1962. Concerning the space available, breeding work began with the set up of a stock consisting of approximately 80 heads of cattle. A portion of the animals were kept in herd, the other portion milked for the supply of the workers until the sixties on the Kovács-farm belonging to Kunmadaras.

Later on the majority of cows from the abolished state farm stocks were brought here as well (Mezőnagymihály, Hosszúhát). In the subsequent period

the number of the stock approximated 200 cows, then in the nineties the state farm fell under privatisation and a part of the stock was sold out to the Hortobágy National Park, where from it got to the herd of the Hortobágy Non-Profit Trust. This valuable, faultless pure-bred stock in the framework of a limited company at Tiszaigar produces yearly good young bulls in draught ox type and send a nice four oxen team to the exhibitions.

#### Bugacpuszta (former Városföld) herd

The herd was also established by purchases (partly from Ohat, partly from the surroundings). The state farm was able to argue for the rescue of the herd by the tourist industry of the town Kecskemét at Bugac, when the National Centre of the State Farms passed its resolution deciding its termination (1962).

For a few years there were only cows in the herd then breeding started again. With precious and consistent work, during the past thirty years one of the most beautiful herds of the country was formed here.

In the process of privatisation of the state farm the ownership of the herd and the Szunyogpuszta young bull center was taken over by the Kiskunság National Park. This herd is producer of valuable breeding bulls for the whole country.

#### The Orosháza herd

It was established in 1972 with 10 heifers purchased from the Hortobágy State Farm and with a bull named *Császár*. At the beginning of the eighties the number of cows reached 70 heads. By the end of the decade the "New Life" cooperative, the owner, for different economic considerations did not increase the number any further, it rather decreased it and in 1993 all the heifers were sold to Dr. Antal Endrei, a breeder from Hódmezővásárhely, while cows were taken over by the Körös-Maros-mente National Park.

#### Kiskunfélegyháza herd

The base of the herd was formed by the tuberculosis positive animals taken over from the Városföld State Farm. The stock was established by some 20 cows, which otherwise would have been sold out for slaughtering as part of the exemption process through selection by the former owner. Several years later the exemption was done by applying the drinking method.

The establishment of the herd was justified by the argumentation that the Kiskunfélegyháza Lenin Agricultural Cooperative had vested interest in tourist industry and wanted to be independent in its activities from the neighbouring state farm.

## The Hungarian Grey cattle breed

The decreasing number of the herd is fluctuating around 80 cows, and its main way of utilisation remained the tourist industry. Its new owner is the Bugac Ménes Ltd. operating at Bugacpuszta.

### The herd of the Fertő-Hanság National Park

The herd was formed in 1992 by transferring the cows of both the former OTÁF (National Inspectorate for Feeding and Animal Husbandry) farm in Szalkszentmárton and the once existing Városföld State Farm now belonging to the national park.

Following the traditions of the Fertőd-Hanság region the area once had Hungarian Grey cattle as well, which was instrumental in a suitable utilisation of the wetlands on one hand, and able to provide the oxen supply for the estates of the Eszterházy princes. With regard to this, the selection goal was to form and fix the type suitable for yoke.

The herd size is increasing in order to utilize well the pastures of nature protection.

### The Hungarian Grey cattle herd of Dezső Szomor at Dömsöd

The stock was established by a horticultural engineer called Dezső SZOMOR by purchasing heifers from Hortobágy, Orosháza, Balatonszentgyörgy and later on from Városföld. Subsequently this herd was completed by animals bought from Csengele and Tiszaigar. Beside the founder, the ownership of this herd is held by a company consisting of several other breeders which put the goal to utilise the grasslands belonging to the Kiskunság National Park. The number of cows exceeded 500 already in 1994, but the size of the pastures allow for the entrepreneurs to think in terms of a number of animals around 2,000.

Husbandry here relies upon the most extensive approaches, which are made still possible by the endurance of the Hungarian Grey cattle. This perfectly suits to the low input system, which—it seems—will become relevant nowadays again. It is planned to treat the most suitable female individuals as a purebred breeding stock, a good mothering ability to be put as a selection goal first of all. This stock will give the replacement for the commercial stock in which commercial crossbreeding will be used. Thus the cow herd would consist exclusively of purebred Hungarian Grey cattle.

Dezső SZOMOR leads the everyday work of the young bull center as well.

A goal would be as well, that the beef produced should not be sold alive, but processed to a certain extent.

A commercial cross breeding programme was carried out with *charolais* bulls. Also the F<sub>1</sub> cows were bred with good results, while the male progeny is slaughtered. It is a good example for other breeders in market production.

### Bocfölde herd

The only Hungarian Grey cattle herd in South Transdanubia has been formed in 1989 as a result of joint efforts of breeders and their devotion towards the Hungarian Grey cattle breed by the purchase of 10 heifers from Hortobágy and 10 from Középtisza. In 2004 the herd was purchased to Károly SÁRKÖZY and now it is at the Sárrét region.

---

### *The situation of the breed nation-wide (1970–1990)*

2. 10.

From the seventies onward a slow increase of the cow stock was to be seen. This can partly to be thanked for the state subsidy as well, but not exclusively, as a considerable part of the stock today do not receive any subsidy. The unprecedented stabilisation in the position of the breed is mainly due to the enthusiasm of the breeders and their faith cast in the more favourable market possibilities in the future, despite the uncertain present, as the country experiences the most dramatic drop in the number of cows.

Table 4 shows the trends of numbers in the past few years.

Table 4  
*Changes in numbers between 1970 and 2004*

year	cows	bulls	year	cows	bulls
1970	500	19	1995	2,100	79
1975	550	20	1996	2,500	83
1980	600	25	1997	2,700	98
1982	800	30	1998	3,000	114
1984	900	35	1999	3,270	131
1986	1,000	40	2000	4,100	167
1988	1,200	50	2001	4,200	199
1990	1,200	55	2002	4,263	259
1992	1,500	60	2003	4,640	274
1993	1,600	70	2004	4,965	300
1994	1,800	75			

The Hungarian Grey cattle breed



*The 2004 year produced rich pasture also for Grey cattle*



*The correct outdoor environment is healthy also for new born calves*

We can regard the Podolian group of breeds as the circle of relatives of the Hungarian Grey cattle. The group is mostly distinguished from any other cattle by the similar conformation of skulls. They also have some other traits in common. Breeds with strong pigmentation belong to here (only a small number of animals have pigment deficiencies, mostly in cultivated varieties). Calves are born with reddish colour (termed "pirók" in Hungarian language), which turns into grey only after several months. Their colour is mostly a shade of grey. In case they are not homogenous ("sooty" [smutty] bulls), the coloration is always symmetrically arranged. They hold their heads higher than other breeds. Cross section of the horn is always circular. The neck is long, trunk is deep and usually flat. The back line is not too attractive because of the protruding withers and high rump bone. The size is very different. Almost all of its individuals are good at yoke, in this respect the whole group is uniform. Fattening capacity is usually better developed than milk.

Zoltán CSUKÁS (1943) wrote: "In the Podolian cattle the poor manifestation of individual characteristics is attributable not so much to the valueless genetic substance, much rather to a negligence of selection towards those characteristics, which sometimes turns unintentionally into some kind of contra-selection."

Breeds belonging here are classified into four groups:

- (3.1.) Noble aurochs-shaped cattle with long horns
- (3.2.) Degenerated primitive cattle having lost their identity
- (3.3.) Improved breeds of Podolian origin
- (3.4.) Relatives in other distant countries and far off areas

The Hungarian Grey cattle breed



89 Csopak (*cartag number: 641/6*) *pure-bred Hungarian Grey bull*



57 Rinaldo (*VT 5461-5/71*) *imported Maremman bull.*  
*This breed shows the closest relationship with the Hungarian Grey cattle*

The Hungarian Grey cattle itself and its closest relatives belong here.

#### Maremman (*razza maremmana*)

Many regard it as a breed identical with the Hungarian Grey cattle, which was only transformed slightly by the different environment during the centuries. It is mostly kept under primitive conditions. It is also primarily a breed of draught cattle, though its capacity to produce beef is more and more appreciated. In certain stocks HORN (1940) could discover much nobility, an almost milking character. It is a wild, strongly built, briskly tempered breed. According to the Italians the Maremman breed is a direct descendant of the auroch, a product of Italian domestication. Its colour is almost identical with that of the Hungarian Grey cattle, but there are darker varieties as well. There is no individual with greenish horns in the breed. Formation and length of the horns are faultless. Its conformation is also very similar to that of the Hungarian Grey cattle, however, the withers height is somewhat bigger, the nasofacial part of the head is usually longer, its horns are a little lighter, the constitution of the legs is slightly less faulty. The rump is significantly wider and somewhat more muscular than that of the Hungarian Grey cattle.

According to the data of BONADONNA (1959) the height of adult bulls measured at the withers is 1.55 m, their weight is 850 kg, the same measurements at cows are 1.50 m and 650 kg. The milk production of the breed is usually regarded as weak. It is mostly kept in big herds, guarded on horseback and not milked.

In 1949 there were still as many as 149,000 heads, but according to the latest information nowadays only less than 10,000 cows are left in the breed.

Its breeding area is Mid-Italy: Grosseto, Siena, Viterbo, Rome, Terni. The Latium variety is bigger, that of Grosseto is smaller. Consistent breeder work began in the thirties to improve the appearance of the breed and to increase its beef production by setting up herds with 50 heads of cattle (GIULIANI 1928). The results of these can be seen even today. In order to increase beef production it is being crossed recently with Charolais or Chianina. The F<sub>1</sub> generation produced quite good results: fattening steers reached a slaughtering weight of 500 kg at the age of 13-14 months.

It was used with fairly good results to introduce fresh blood into Hungarian Grey cattle between the two World Wars. After World War II, in 1971, four Maremman bulls were imported thoughtlessly, on superior orders. One of them got into the herd of the Városföld State Farm (*Herode*), and three

to the Hortobágy State Farm *Rinaldo* (Bananese), *Carlo* (Bastellone), *Digo* (Friolano). The import was justified by the elimination of adverse impacts of inbreeding, though in the stock, which was indeed fairly diminished and more and more inbred, there were no signs of adverse impacts of inbreeding. The imported Maremman bulls would really have been able to improve conformation without damaging the character of the breed. Maremman progenies were characterised by beautiful long horns, extraordinary depth, greater live-weight, slightly elongated head, wider, more muscular body forms, correct leg construction, sometimes sloping rump. There was much more positive than negative impact from a point of view of beef production and general appearance. In the meantime, however, the utilisation of the breed became exclusively gene conservation, according to international standards by this time, therefore Maremman progenies were gradually sorted out from the beginning of the eighties, and their effect on the breed today can be regarded as insignificant. (The most recent importation of the Maremman should be supplemented with the embarrassing fact, that *Herode* brought into the breed the 1/29 chromosome translocation which has an adverse effect on fertility. Since then this hereditary disorder was successfully eliminated).

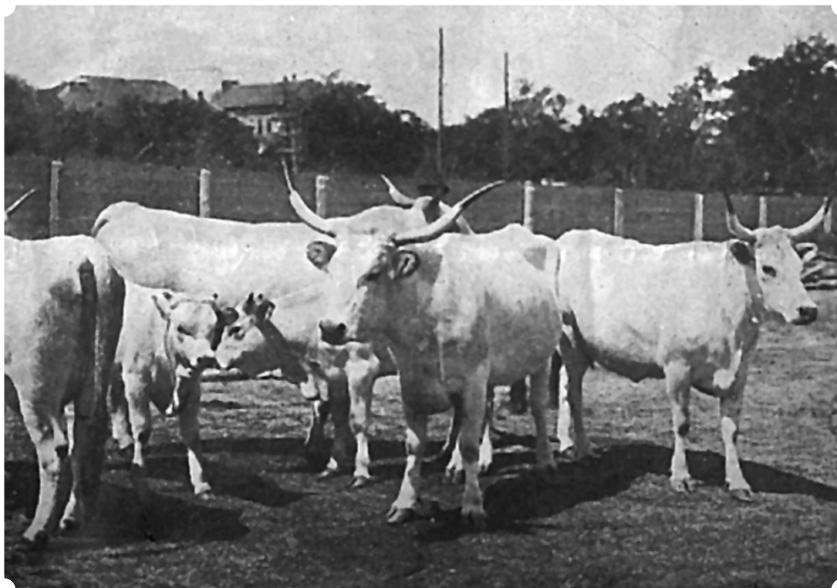
#### Transsylvanian breed

It can be regarded as distant relative even less than Maremman, since this breed was often crossed with the Hungarian Grey cattle over times. Yet it must be discussed separately, because there was a distinct difference in the breeding philosophy of the breed, and since new boundaries were drawn after World War I, its fate was shaped differently. Transsylvanians were very much fond of this breed. At the end of the last century several applications were submitted to the Ministry of Land Use to save it. From 1895 on at the Kolozsvár fairs this was the only breed ever to be awarded. At the end of the 1800s such a serious breeding work was started in Transsylvania, which hardly had any precedent in the history of the Hungarian cattle.

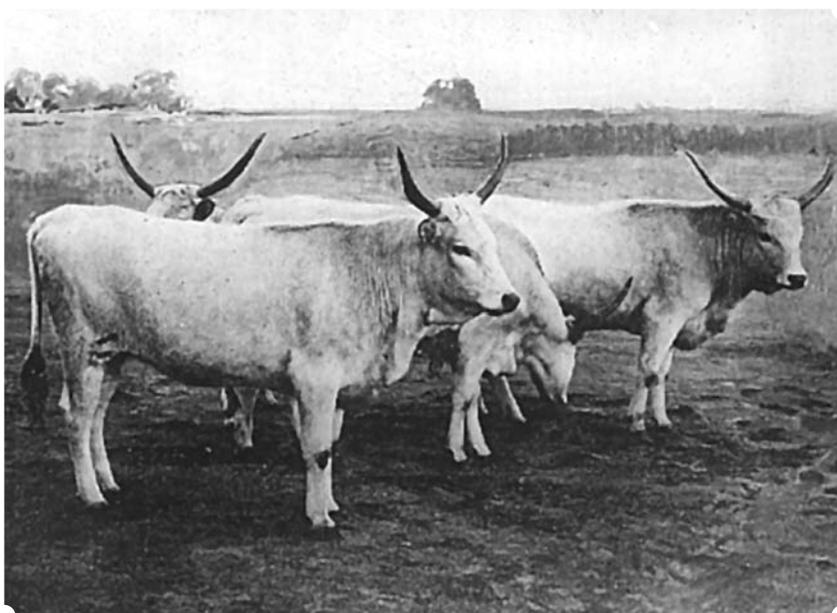
With regard to the character of the breed selection for beef production proved to be more effective and brought quicker results, than that of milk production. Despite this fact in the field of milk production the best and most significant results were born here and then. Preservation of draft characteristics were considered to be very important as well.

As a consequence of this work which lasted for a couple of decades, the values of the breed have increased substantially in certain stocks. Thus the daily weight gain and the good beef characteristics were kept in mind by the breeding stocks of Ferenc SPERKER at Szentdemeter, of Arvéd TELEKI at Drassow and of the Radnót Roman Catholic Status. Beef characteristics

Relatives of the Hungarian Grey cattle



*Transylvanian Grey cows*



*Very well developed beifers from the Mezőbényes herd*

improved substantially, the daily weight gain increased decisively. Some heifers reached 420-430 kg by the age of one and a half year, and by the age of 3 they were 580 kg in weight. In the stock of Drassow the weight of yearlings in the average of 88 steers was 345 kg, two-year-old 560 kg, while the weight of a steer named *Lebel* was 750 kg at the age of 30 months.

In selection for milk production the best results were achieved by the stocks of JÓSIKA at Kolozskara and Ferenc LÉSZAY at Magyargorbó. Yields of the Kolozskara stock were the following: in 1884 1,500 l, in 1893 1,964 l, in 1905 2,400 l without the milk consumed by the calves. In the account of SZENTKIRÁLYI (1926) is mentioned a Hungarian Grey cow named *Fickó*, which gave 3,503 l milk at the milking competition in Kolozsvár without the milk consumed by the calves, but there were many other results above 2,500 l.

Doubtlessly, the milk consumed by the calves renders the value of these data uncertain, yet it can be stated, that it is a pity, that the result of this excellent breeding work is lost, it is a pity, that it was impossible to go on with it. Breeding stocks with fame were, among others, the following in these years: Ernő BÁNFFY at Kolozsborsa, Géza TELEKI at Gernyeszeg, Albert SOMOGYI at Héjjasfalva, Mrs. Henrik ROTHENTAL at Szőkefalva, János LÁZÁR at Szászmáté and Béla WASS at Mezőzáh. Good milking areas were formed around Kolozsvár, Marosvásárhely, Nagyenyed, Brassó, Szászrégen, etc. Alongside the Nyárád river another milking variety was being formed. Performance results however, have to be evaluated with regard to the distance of a whole century.

The Transsylvanian cattle was somewhat heavier, stockier, shorter legged than the variety in Hungary, with wider shaped horns. Former experts considered the Hungarian Grey variety more pigmented and more attractive. The cattle of mountainous regions were somewhat smaller in weight.

According to a breeding district list made in 1924 it still had its own breeding district at this time. András PIACSEK (1934), who was sent to Transsylvania in order to bring individuals suitable to introduce fresh blood into the breeding stocks on the Great Hungarian Plain, has already stated in the thirties, that the situation of the breed is critical.

CONTESCU, in 1958, mentions the Transsylvanian cattle still, which among the Rumanian conditions of the time, only distinguished itself by its drought character, but its independent breeding district ceased to exist. By the mid-sixties it can be considered extinct in whole Transsylvania. (PAPP 1966) No cows or bulls were around by then, it was only a few crossbred oxen which resembled the former breed.

Certainly, the Great Hungarian Plain variety of the Hungarian Grey cattle existed in Yugoslavia as well, in the South of Bácska, in the Bánát and

Szerémség. A major part of these stocks perished, all which is known is that a small number herd was transported by the Croatians from the surrounding of Fruska Gora to the Istria-peninsula and they are preserved as gene reserves there. At the beginning of the seventies another stock existed around Vukovar as well, a few individuals of which were imported to Hungary (Szalkszentmárton) without having a significant impact on the Hungarian stock.

At Beska near to the Danube a farmer Rado TISMA kept some thirty Hungarian Grey cows in excellent breed character. He died in 2002, and now many individuals of his breeding material are spread in Vojvodina and the big part of it is purchased in Hungary. A good herd exists in Bácska-Topolya as well.

---

*Degenerated primitive cattle having lost their identity*

3. 2.

This category contains breeds, which, though they are of Podolian origin, due to bad management and different crossings (mostly of brachyceros character) show neither the beauty and nobility of the former group nor the similarity to the auroch. Breeding work was done in recent years at maximum with these breeds. There are only a few references and very confusing terminology in the literature about them. They are mostly smaller in size, have somewhat shorter horns and poorer beef traits. There are several transient forms among the individual breeds both in terms of conformation and performance. Variety is great within the breeds as well.

These breeds are discussed shortly, based mainly on the books of HAMMOND, JOHANSSON, HARING (1959) (as regards historical data) and FELIUS (1985).

### Italy

Podolian breed (*razza podolica*). Earlier references discuss several local breeds under the names of Apulian, Pugliese, Abruzzoso, Montanara, Puglieso del Basso Veneto. More recently they are united in one common group. Ranging from the auroch-like cattle up to the Romagnola-character cattle selected for beef traits, any variety can be found in this breed. Animals belonging here are tough, unassuming, with a relatively big body. Liveweight of bulls is 500-1,000 kg. Milk production is poor, it is assumed to be 5-800 litre in average, though there are individuals in the hands of private breeders which perform better than that. It is mostly a draught animal. Since the boom of mechanisation different crossings are suggested. In 1959 there were 130,000 heads of it.

## The Hungarian Grey cattle breed

### Serbia, Croatia, Slovenia

Posavina cattle. It lives in Slavonia and in the valley of the river Sava, furthermore in Northern Bosnia. Its height measured at the withers is cca. 125 cm.

Kolubara is bred in Serbia, Krk at the Croatian seaside. The latter one is somewhat smaller than the former ones. ADAMETZ (1892) previously described in detail the cattle breeds of Podolian character in Serbia and Bosnia and their transient varieties towards the brachyceros-type Balkan cattle. The Istrian primigenius cattle are bigger, with a height of 130-135 cm at the withers. It is bred for yoke and beef, more recently considered as milk producer as well. It grows as big as 500-550 kg. The impact of Mareman and improved Italian breeds can be noticed. Its number is minimal, a few dozen individuals of this breed might exist also in Croatia where an effort is made to preserve it from extinction. A few specimen can also be found in Slovenia and on the Italian side.

### Albania

Mursi. A cattle of equally Podolian blood. It grows some 115 cm high. Weight of cows is 300 kg. It shows an influence of the big-headed cattle.

### Bulgaria

Bulgarian Grey cattle. It contains some Brownieh blood. Isker cattle—Rodope cattle. Height measured at the withers reaches 110–120 cm. It also appears under the name *Iucar*.

Thracian cattle. Of the three cattle breeds, this one contains the most Primigenius blood. With regard to production it is of the least value. Height of cows measured at the withers is around 115 cm, their liveweight is 300-340 kg. These breeds are all to be considered endangered.

### Rumania

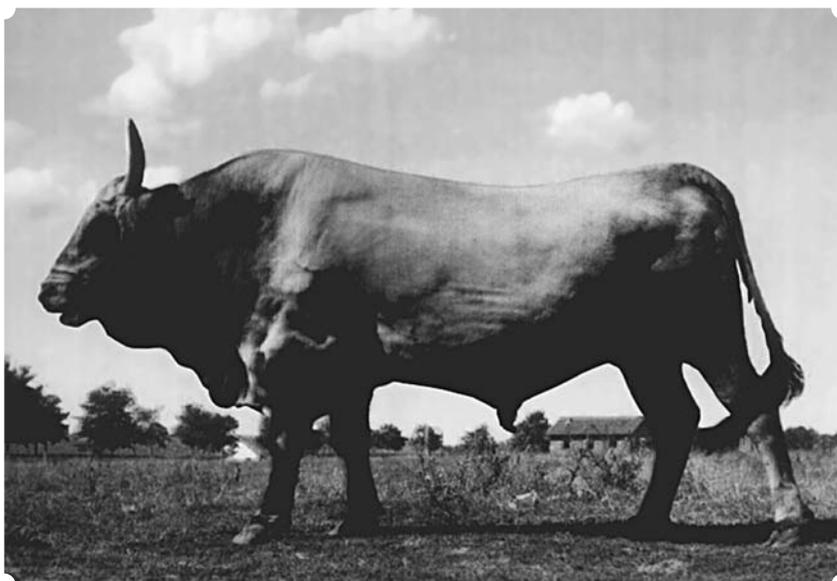
Beside the extinct Transsylvanian breed several other Primigenius breeds and varieties used to live here.

Moldavian Grey cattle. In the fifties it still had two breeding districts around Iași and Birlad. Since then these were terminated, and the stock was crossbred, mostly by Brownieh. As long as it was under improvement, the breeding stock was situated in Popauși. It belonged to the breeds with average horn length. The height measured at the withers was 130-135 cm, its liveweight 350-450 kg, heart girth 170-180 cm, leg circumference 17 cm. Individuals selected for exhibitions reached a withers of 141 cm height with a heart girth of 208 cm. Its appearance was quite similar to that of the Hungarian Grey cattle, but leaner, frail-looking, shorter horned individuals

Relatives of the Hungarian Grey cattle



*The Istrian Grey cattle threatened by extinction shows the influence of the improved Italian Podolian breeds*



*The Ukrainian Grey cattle did not prove to be suitable in an attempt to introduce fresh blood in the Hungarian Grey cattle*

were common in the breed. Its improvement was mostly done for higher milk production. The average milk production is 1,750-2,215 l of milk with 4.65% fat, but record yields of around 4,500 l have also been reached.

Boksán, Buksana, Bucsán, Busák. Also a Moldvian variety: smaller, stockier relatively more muscular animals with quite good slaughtering weight. Its determined breeding district stretched mixed with the others. Lead coloured and dove-grey varieties were distinguished.

Wallachian, Jalomica variety. It contains the genes of the Transylvanian breed to a great extent. In 1950 there were still relatively good quality stocks around. In the herd of the plant improvement station in Studina the average milk production reached 3,000 l, with 4% fat.

A small bodied, cca. 300 kg liveweight, agile variety lives along the Danube under extremely harsh conditions. It was mostly used for draught, on highways it could also run by trotting. This breed produces extremely little milk.

Dobrudgia breed variety. It is considered to be of Bulgarian origin and named also as Iscer cattle. A very small animal, the cows weigh merely as much as 200-250 kg. Its milking capacity is relatively good compared to the liveweight.

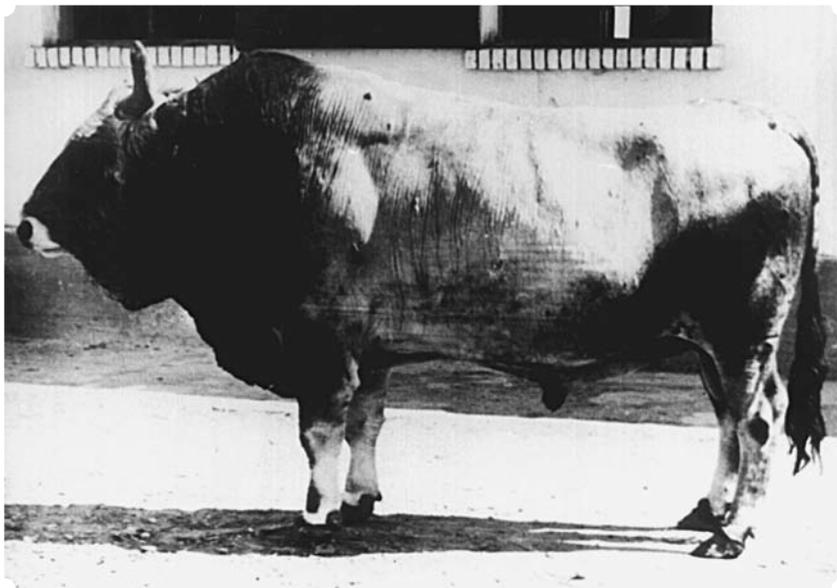
According to the classification in 1924 all these still had their breeding districts. In Rumania, no preservation of gene reserves was started, which would have been able to prevent the decline and extinction of Podolian breed varieties there. Today these genes can only be found in crossbred animals and therefore the reconstruction of these breed varieties is doubtful.

## Ukraine

Ukrainian Grey. Similarly to the Italian Razza Podolica, the term includes several breed varieties, which often were represented in the technical references as independent breeds: Tserkassy, Cserkesz, Bilhorod, Asovia, Podolinian, Kubán, Cuban, Tawrii, Crimean, Black-Sea, Caucasean, Bessarabian, Poltavian, Hucul, etc. The differences between them faded gradually, as they were based on different environmental conditions and not on inheritance. Its colour is like that of the Hungarian Grey cattle, but animals with faulty pigmentation often occurred. In their appearance they showed quite a great variety. Horns are generally shorter. Milk production is usually poor. However, in better state farms cows with good milking ability also occurred. LISZKUN (1952) demonstrated through investigations on the histology of the udder, that this breed is also able to produce more milk.

36 The assumption is justified by the performance of the cows named *Choroda*

Relatives of the Hungarian Grey cattle

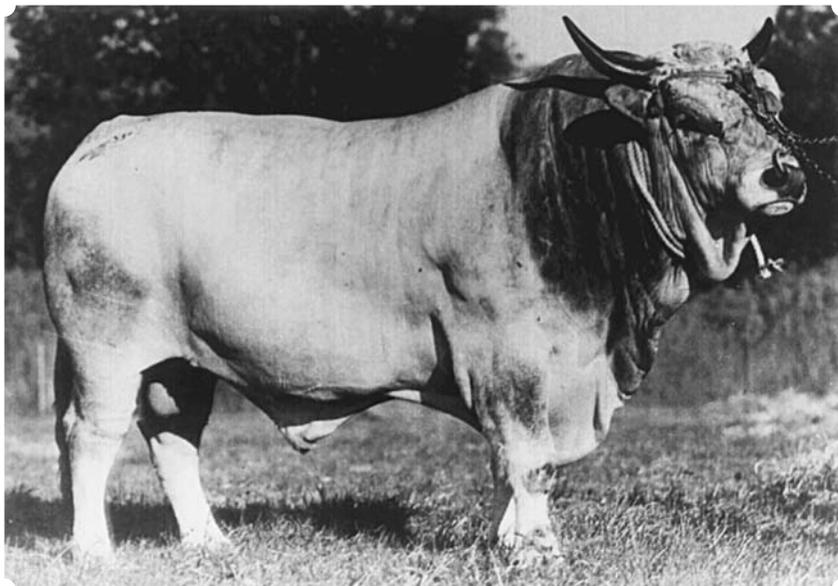


*The Bulgarian Iscar cattle also belongs to the Podolian breed group*

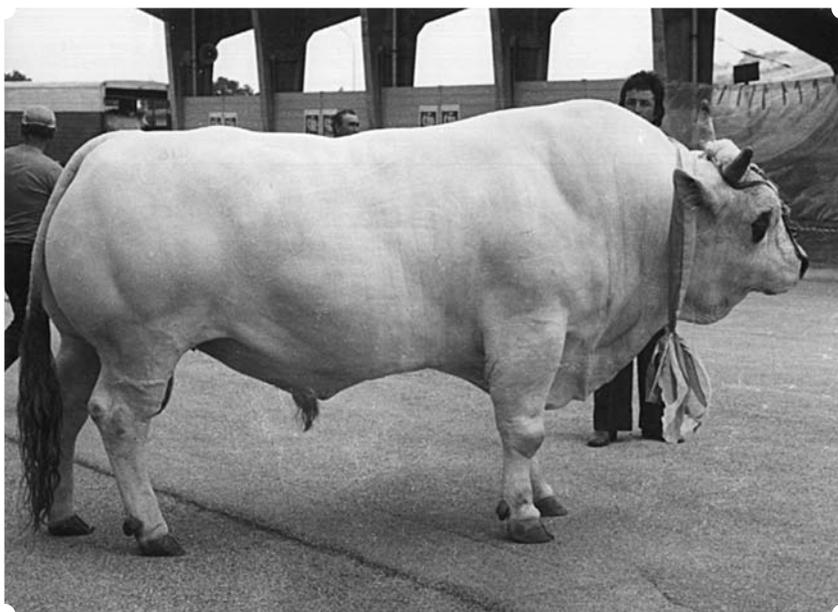


*8464 Jugó imported bull, which was not used due to faulty breed characteristics, but sorted out under the pretext that it was "dangerous for humans"*

The Hungarian Grey cattle breed



*The Romagnola is an excellent beef cattle breed of Podolian origin*



*The Marchigiana is the most popular Italian beef cattle breed*

Relatives of the Hungarian Grey cattle



*The Piemontese cattle excel with splendid musculature*



*The Chianina are the biggest cattle of the world and this breed stands in distant relationship with the Hungarian Grey cattle*

## The Hungarian Grey cattle breed

with 4,147 kg and *Jalosja* with 5,322 kg. The average performance of the Polivanovka state farm are the following:

1st lactation 1,620

2nd lactation 2,259

3rd lactation 2,822 kg milk.

The average liveweight of cows is around 520 kg, that of bulls is 700 kg. Naturally, public breeding included animals with smaller liveweight as well. To improve the beef production of the breed, it was also crossed with different beef cattle. Presently it has only one stock struggling for survival with a few hundred cows. The genetic varieties of horn conformation are published by GLAZKO (2000).

## Greece

The country has a cattle breed with small body and short horns, which is also of Podolian origin. Its colour ranges from yellow to brownish-black. Liveweight is 200-250 kg. It is mainly a yoke type breed. Its little milk contains around 5% fat. Due to the influence of different foreign breeds the breed is in a critical position, a Greek company aiming at the maintenance of rare domestic animal breeds makes efforts to save it.

## Turkey

The Thracian cattle were given a role in the formation of the local breeds in this country, in cases through its crossbreeding with Brownvieh. The Podolya cattle or Plewner is also of Primigenius origin, which is mostly bred in Thracia and Anatolia. These are also relatively small, primitive-type animals with a little hint of Brachyceros.

---

### *Improved breeds of Podolian origin*

3. 3.

Those Podolian breeds belong here, which are apt for modern utilisation as a result of the careful breeding work. The group contains exclusively Italian breeds, which were selected for beef production, beside being excellent draught animals in older times as well.

Romagnola. It was improved in the nineteenth century. In 1869 its number was merely 68,000, while in 1959 more than 550,000. Presently it counts less than 100,000 cows (BODÓ and others 1985). It is bred on the plains of Forli and Ravenna, around Bologna, Ferrara and Pescara. Two varieties are known, Gentilo (this is more improved, more demanding and maturing earlier) and Montana (more "Podolian", tougher, wantless). The

colour is grey, with a certain extent of darker shade in the case of bulls. Its horn counts as short within the group, but compared to other breeds it is still a little too long and strong. The breed displays excellent beef forms.

The height of cows measured at the withers is 145-155 cm, liveweight is 650-700 kg, the withers height of bulls is 155-170 cm, liveweight is 1,000-1,200 kg. Daily weight gain: 800-1,200 g daily. Slaughtering weight: 58-60%.

It is excellent draught animal. Its meat is well marbled, not greasy. Recently it was pushed back by the French breeds, not being competitive in international use, though there are a few specimen to be found at some of the artificial insemination stations of the US.

Marchigiana (Razza Marchigiana). Improved recently and the most widespread Italian beef cattle breed. It contains the blood of Chianina, Romagnola and Pugliese. It is mostly bred in mid-Italy. CSUKÁS mentions only some 300,000 heads in 1943, but by 1959 the number exceeds 520,000. Since then the stock declined somewhat.

It is used to improve the breeds of mid- and Southern-Italy. Slaughtering weight reaches 60-65%. It has a role in supplying beef for Rome. Daily weight gain is 1,040-1,350 g. A fully developed, fattened ox weighing more than 2 tons was also measured in this breed. The withers height is 160 cm for bulls, 136 cm for cows. Liveweight is 1,200, and 680 kg, respectively.

Chianina, that is from the Chiana valley (Razza Chianina). Its Podolian origin is questionable. A breed having enormous body (there was a bull weighing 1,740 kg in breeding condition). This is considered to be the biggest bodied cattle breed of the world, though more recently its not so big type is favoured. The breed was improved by the Romans for purposes of sacrifices. They needed big, white coloured faultless animals for the sacrifice called *suovetaurilia*. At the beginning of the sixties it had a number close to 300,000, by now this number declined substantially. Its breeding area: Val di Chiana, Arezzo, Lago Trasimeno, Florence, Sienna, Pisa, Perugia, Terni. Four varieties are known. The sizes are shown on Table 5.

Table 5  
*Data of the Chianina varieties*

	withers (cm)		liveweight (kg)	
	bulls	cows	bulls	cows
Chiana valley	170	158	1,200	800
Valdorno	170	160	1,200	800
Calvana	170	150	1,100	700
Perugia	160	140	1,000	700

This is also a cattle breed producing beef and power. It is not as good as the Maremman, therefore it has been crossed with this and with other, more primitive Podolian breeds, in order to improve its draught characteristics. A typical fault in the constitution of the breed are the long legs. Some individuals with faulty pigmentation also occur in the stock. Its meat is marbled.

An interesting fact is, that the 12 month standard weight of these three improved Italian breeds for bulls is 480 kg, yet the height measured at the withers in Romagnola is 130 cm, in Marchigiana 135 cm and for the Chianina bulls is 138 cm (BODÓ and others 1985).

Razza modenese. It mostly contains Romagnola blood. Daily weight gain is 800-1,000 g. Bulls are 1,000-1,300 kg in weight. Average milk production is 2-3,000 l, but there are cows with 4-5,000 l and 3.3-4.8 % fat.

Razza piemontese. It is mostly considered to be of Brachyceros, origin, with significant Podolian influence. There is another theory which claims that the excellent beef characteristics of the breed would be due to the impact of the zebu which got here from Pakistan. The Piemontese belongs to those very rare breeds, where part of the breeders do not sort out animals with culard character. Today it is mainly considered to be of beef character, though originally it used to be a cattle of triple utilisation and with poor milk production (2,200 l).

CSUKÁS (1943) mentions the very fertile Chianina-Maremman breed, which has both excellent draft and beef characteristics. Recent references consider this as a cross breeding product.

---

*Relatives in other distant countries and far off areas*

3. 4.

It is a very difficult task to provide detailed description on the cattle breeds of more distant countries. There are certain breeds, which are regarded by some authors of Podolian origin, and there are others, which come into consideration by the similarity in their appearances. Though the name Podolian does not refer to this, yet is conceivable, that these long horned, and despite the improving breeders' work, of the auroch only slightly different breeds started from somewhere around the Mediterranean, the place of the first domestication of the auroch. During their diffusion there were some, which changed considerably, yet some others remained similar to the original type to a greater extent.

On the Iberian peninsula cattle breeds propagated, which were presumably a relative of the Podolian, but have been separated more previously. These are: the Pirenean cattle, Razza Tudanea, Gallega, Razza Morena,

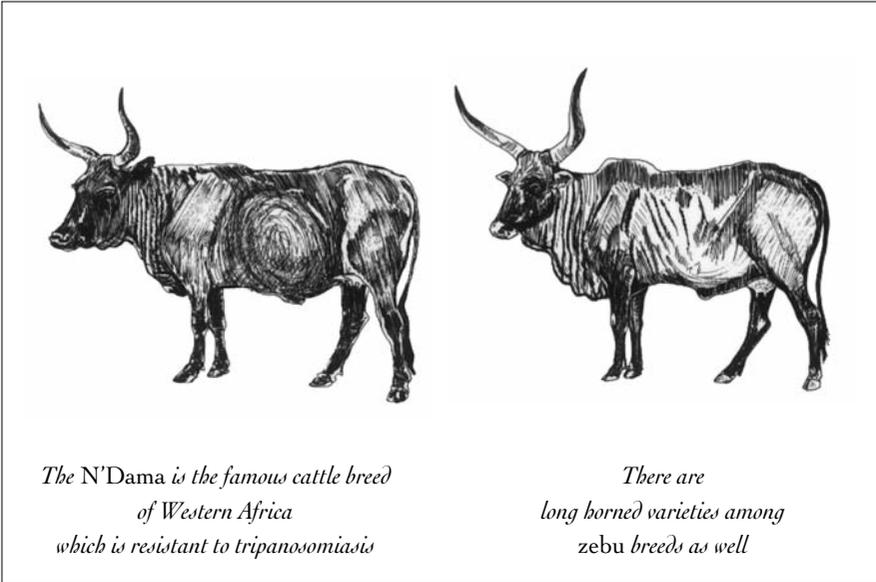
Relatives of the Hungarian Grey cattle



*The American Texas Longhorn is a distant relative*



*Only the colour of Gascoigne cattle is similar*



Rubia, Cachena (MONSERRAT 2000). In Portugal the relevant breeds are the Baroza, Bajocara, Minkota, Transtagano. In Latin America the widespread Criollo and the Texas Longhorn left this same group of breeds.

According to the technical literature Northern Africa was the homeland for the long horned cattle in the ancient times. Today however, Arabian countries mostly have brachyceros cattle, with some primigenius influence. The Libyan and the Brown Atlas cattle are almost entirely of primigenius character, primitive draught cattle. Most probably the West African N'dama breed is related to them as well, which is famous for its resistance against trypanosomiasis. The improving role of Spanish and Portugal cattle can be identified in Kongo as well. Africa has some long horned cattle as well, but these are mostly of zebu origin. These are the Arzaonak (Nigeria), Namasschi (Kamerun), Fulani, Gobra (Senegal) Watussi (Ruined), Bahima (Uganda), Barotse (Angola) Nyambo, Chad or Kuri cattle (Chad, Niger, Kamerun). Similarly, genes of the long horn are carried on from the feral ancestor by the zebu breeds called Danakil (Ethiopia) and the Nilotic (Sudan).

In South America there are cattle mostly of Iberian origin, more or less improved with different British breeds. Such are the Criollos in Venezuela, Criollo in Chile and Paraguay, Caracu and Franquero in Brasilia. In Columbia there are cattle of Spanish origin.

Four more primitive breeds are to be mentioned, which keep relationship with the Podolian breed mainly by their similarly harsh condi-

tions, and reserves something of the ancient character: the Scottish Highland cattle, the English Park cattle (its non-domesticated game preserve variety is the Chillingham cattle), the fight cattle of Camargue and of the French breeds, the cattle of Gascogne. The list certainly could go on infinitely.

Summarising what was said on the relatives of the Hungarian Grey cattle, it can be stated that the only really close relative beside the Plain cattle still existing in Croatia is the Maremman. Other breeds called relatives are either too degenerated and lost their noble and auroch-like character, or the relationship can only be determined by more or less fantasy.

Anyway, there is no particular significance of the issue nowadays, since instead of introducing fresh blood the importance of keeping the originality of all the breeds is emphasised, and no mixing should occur with the other breeds. Experiences so far offer hope for the preservation of the differing characteristics of these breeds over the generations without the adverse effects of inbreeding.

By the miraculous development of molecular genetics we hope to get more and more data on relationship of cattle breeds (DOVČ 2000).

## CONFORMATION OF THE HUNGARIAN GREY CATTLE; TYPES WITHIN THE BREED

4.

### *General considerations*

4. 1.

In modern animal husbandry, more and more the performance is the sound basis for judging animals and stocks and the significance of judging by conformation has diminished. This is true even then, when in the breeding of some breeds (Holstein-friesian, French beef cattle) the judging of conformation and appearance is brought to the forefront again.

Judging the conformation of the Hungarian Grey cattle is more important than that of other breeds, for the following reasons:

- When preserving genetic resources, one of the most important tasks is the preservation of the characteristics, which is greatly supported by the observation and judging of the conformation,

- Nowadays, with the advance of single utilisation beef cattle husbandry the danger arises, that the Hungarian Grey cattle will be judged by an expert, whose eyes are accustomed to other breeds' conformation and types, which would result in a change of the breed in a non desirable direction.

- Beside preserving the character of the breed and the available variances, another goal is that animals which are aesthetically more valuable and more beautiful, should be represented in a greater number in the herds and this work also closely related to the judging conformation,

- Constitutional toughness is one of the most essential economically important characteristics of the breed. This can be identified with fairly great certainty by observing the appearance of the given individual.

For experts looking for better beef characteristics the Hungarian Grey cattle are strange, because the fact should be considered, that its head is longer, back and loin narrower, withers more outstanding, hip protruding, rump diminishing, split higher, chest more flat, and the whole animal is less round, less fleshy than expected from ordinary beef cattle.

Significance of the horns of the Hungarian Grey cattle cannot be underestimated, while in the case of other breeds almost nobody cares about horns any more in this country.

Difficulties might arise in judging conformation of Hungarian Grey cows or bulls from the fact, that even in the case of appropriate management practices, the condition of the stock changes considerably (it is influenced by the seasons to a great extent). Yet it is true, that no judge is able to get rid of the influence exerted by the condition of the animal. This

is one of the reasons, why empty cows in good condition cannot be judged among their peers with calves. To judge cows the best period is mostly summer. By this time they are in good condition and the weather is also generally nice. Hungarian Grey cows can be usefully observed in winter and early spring as well, in order to get information on some of their traits being most apparent in these periods (such as colour of hair, the quality of winter hair, back line, bony structure of the rump), yet for a general judging this time is not appropriate for the general impression of the animals is not favourable. Judging of bulls however is best done after spring shedding, because this time they are prepared for mating and in good condition, so that their colour and forms are shown best. By the end of summer their hair fades and they loose some of their condition as well.

Further difficulties are caused by the need for preservation of several types within the breed and value of conformation must be determined within the types, since no distinction in the value of the individual types is allowed.

For cattle kept outdoor all the year round it is totally inappropriate to be led on rope for judging, because the animal would resist, move around and no objective judging will be possible. Judging therefore is best undertaken either in a corral or on the pasture (this is the best, though somewhat tiresome method), but in any case, it should be carried out in the open air with free moving animals.

In the following the description of the conformation of the Hungarian Grey cattle was prepared using the references below:

- MNOSZ 6802 “Herd book conformation judging of cattle” Hungarian standard;
- Oszkár WELLMANN (1937): “Description of breed character of the Hungarian Grey cattle”;
- Period issues of the journal entitled “Köztelek”;
- J. SCHANDL (1954): “Szarvasmarhatenyésztés” (“Cattle Breeding”);
- A. HORN: “Állattenyésztés” (“Animal Husbandry”);
- I. BODÓ (1968): “A magyar szürke marha küllemének és teljesítményének megítélése” (“The judging of conformation and performance of Hungarian Grey cattle”) The teaching and experiences of late András PIACSEK, one of the best judges of the Hungarian Grey cattle;
- The conformation scoring scheme in young bull catalogue (2002-2004).

### General impression

When judging Hungarian Grey cattle, attention should be paid on the fact that it goes about a breed with tough constitution which grows relatively slowly. The maintenance of this toughness and hardiness is a selection goal in the future as well. Therefore any faults in the conformation which refer to a lack of constitutional toughness should be judged very strictly.

The lively, ground-gaining movement of the breed is very important, the clean joints, steely tendons and ligaments are essential. Its musculature is tough, but not voluminous.

With regard to the fineness of the constitution the breed is not homogenous: there are types with very fine constitution and coarser types as well, both having their reasons for existence.

Body proportions of the breed are different from the improved beef and dairy cattle. The front part is usually more powerful, the rear is weaker. (The old saying demonstrates this by claiming "a lion in front, a dog in the rear").

The legs are somewhat longer than that of other breeds, trunk should be rather deep than wide, but it is very important, that the Hungarian Grey cattle should have proper length. Head is carried high, its appearance is attractive, its stature radiates beauty, nobility, strength and toughness.

### Colour and hair

The Hungarian Grey cattle is to be found in shades ranging from silvery to dark crane-colour. Proceeding from the entirely light towards the dark the following shades of colour are distinguished: cream-coloured (a serious fault of the breed character, it only occurs in crossbred animals), silvery white, silvery grey, crane-like, crane-coloured, dark crane, blackbird (this is very rare in Hungarian Grey cattle, more common in Maremman). The shade between crane and silvery grey, if compact, might be called blue as well.

The colour of the bull is more diversified than that of the cow, but cows are not entirely identically coloured, either. Generally the front part of the trunk is a little darker. Black "eye glass" of the bulls belongs to the breed character. Neck, forefront of the forearm, slightly the shoulders, withers, chest and belly sideways and at the bottom, then particularly the rear quarters are black, or at least more or less "smoky".

The hair often has a sorrel shade on both the shoulders and the withers. If this is just a very slight coloration, it does not count as fault. If it is widespread, it is called dirty hair and diminishes the value of the breed

character. The too smoky, almost black colour of bulls (the equivalent of dark crane in cows) is not very popular, but it is not a fault of breed character. The hair coat is short, thick and straight in summer. The compactness of the hair is important, so that it could give protection against cold.

At the basis of the horn of cows, the longer hair of the poll becomes a crown-like formation, which takes the form of curly hair on the bulls' forehead. Attractive-looking hair on the forehead used to be considered a visible characteristics of the good breeding stocks.

The skin is well-pigmented and slate coloured. The colouring of regions around natural orifices in the body is dark grey. Pink skin occurs between the thighs in the inguinal region, on the testicles, on the udder, and in the ears. The lower third of the scrotum, however, is black. The palate can be pink, slate or spotted in colour. The slate-coloured palate is the most favoured one, though, even if it is selected for a consistent selection is not feasible. It is advisable to register the pigmentation of the palate while tattooing the calves (usual codes are: SS—grey-coloured, SSP—grey with pink spots, SP—half grey, half pink, SPP—grey spots in a pink area, RR—pink all over). We do not know where pink and spotted palates originate. To have a breed with slate-coloured palate all over, is sure to take a very long time. In selecting breeding bulls this is also a factor to be considered.

The area closest to the mouth is bright-coloured, which results in so called "thrush-mouth" with dark or smoky-coloured individuals. The hairs of the eyelashes, sheath and the switch are black. The hairs of the ear tufts are brown.

The muzzle is black with a thin white stripe ("piszra"). The lower lip is also black with an occasional small white spot. The tongue-back is lead-coloured. The hoofhorns and dew claws are dark slate-coloured.

The colour of the animals varies according to their age. The calves are reddish brown-coloured at the time of their birth. This phenomenon is, however, not uniform. The following variants are to be distinguished: dark reddish, reddish, light reddish, pale (with some red hue) and markedly pale (without shades of bluish grey and red). The last two variants are not particularly liked, which can, however cause problems only if there is a high incidence of individuals with this pattern of colouring in the cattle stock.

The reddish-colouring turns paler when the animals are 2-3 months old, then it starts turning to grey. By the time the calves are 4-6 months old, they are grey all over. The characteristically smoky colour of the bulls is often identifiable right at the time of weaning (and often it is the bright-coloured suckling calves that have this hair colour), but it only becomes really smoky by the time they are 3-4 years old.

The colour of the hair coat is affected by the current season. In winter, the colour of cows is darker. It is in spring, after the shedding that the animals have the nicest colours, especially the bulls (“when they have got rid of the old hairs [avas]”). Generally, the long hair coat during autumn and winter contains a considerably higher number of reddish hairs, therefore the judging of the colour of winter hair should be done carefully. This tendency of colour change is identifiable in areas of the hair coat such as the forehead and the shoulders.

### Faults in colour

Too light coloured animals are not popular, because according to the general—though scientifically not proven—belief this means less toughness and resistance. A fault and reason for disqualification is the cream coloured hair, wide spread and sharply edged pigment deficiencies and spottiness.

White or strongly white haired switch qualify to be a fault in breed character as well as a lack of eye rings in bulls or the fully confluent black colour on the head.

Sometimes coloration similar to that of the bulls occurs in cows as well. It is relatively common that the front part of the body is a little darker in shade. This cannot be regarded as a fault. Sometimes however, eye spots or even rings come forward, and other times smokiness, which is desirable only in bulls, can be seen on the forefront of the forearm or on the thighs.

Today the view is held that this refers to foreign breeds but only if the extent is great can it be regarded as a fault in breed character.

A forehead with sorrel crown is not popular, but not a serious fault. Slight sorrel colour can be overlooked on other parts of the body, but dirty hair counts as a fault in breed character.

In winter, a white blaze shade is not a serious fault on the head. However, sharply edged blaze is a fault in breed character.

Spottiness should be judged to be more or less serious fault in breed character according to the extent of them.

White spot on the mouth qualifies as colour fault, if it extends strongly in the middle or if it is too wide at the angle of the mouth. The pink stripe should be so narrow, that it should not attract attention of a casual observer.

### Colour of the horns

The middle of the horns is mostly white, the distant third is black. The basis of the horn is mostly off-white. Horns of calves and young animals are dark

grey. It begins to clear up around the age of two-and-a-half to three years and the final colour is formed by the end of the fourth year. Yearlings have dark grey horns. The basis of the horn of two-year-old animals foreshadows the prospective white horn by pink or rosy spots. Three years old females show already the colour of the horn, but it only reaches its final clarity by the fourth year. A horny node is at the end of the horn, when this disappears, it can be said, that the horn is completely clean.

There are colour patterns indicating faultiness and deviance from what is known as normal colouring on the horn as well. If the black part on the horn peak extends over more than one third of the upper part of the horn, this horn is designated as one with smoky colour reaching deep down, while if it covers a smaller than usual area on the horn, it is referred to as one whitened further up. Neither colouring is popular although it is part of the variants that characterise the breed.

Among the cows bred in Hungary there are many with green horn. If the horn displays this kind of greyish green colouring, it cannot be referred to as a faultiness in the characteristics of the breed in question, which used to be a feature of primitive breeds. If the green horn is glossy, it is called oily horn. Horns are also characterised by shades such as greenish and "not-quite-white". We prefer horn which is white as this is aesthetically more acceptable, nice-looking variant. Yellow is regarded as a faultiness in the characteristics of a particular breed. A horn with recurring patches of green or greenish grey was referred to in the Debrecen region as "kártyás" horn.

A wax-yellow or striped horn is regarded a faulty characteristic. It is a phenomenon identifiable mostly with pale-coloured cattle.

## Head

The head of the grey cattle is one corresponding to the characteristics of the primigenius skull: the head contour is strait, the forehead is flat, the head as a whole is elongated, the horns with a circular-shaped cross-section are stemmed in the outer upper edge of the forehead. In our present stock not all individuals have this head shape in its entirety. There are other, shorter head shapes, referring to some unknown foreign influence.

The head size should be proportionate to the size of the body; too big or too small heads are equally regarded faulty conformational characters. The too big head mostly refers to some problems in the raising of the young animals, while an undersized head is the consequence of inbreeding.

Proper horn width at the basis is essential. Narrow gap between the branches is, of course, a frequent occurrence. Experts with a long breeding experience hold the view that the width between the horn branches is close-

ly related to the daily weight gain. This idea seems to be proven by the observation that the photographs of prize-winning bulls and cows show horns with a wide gap between the branches and broad foreheads corresponding to such horn shapes. The nicest-looking head-shape is one with an almost straight profile, with a broad forehead and poll, complete with slightly protruding eye-vaults, something that even many, roughly-shaped cattle with a curved profile have. However, we have also rather many cattle with coarse head and convex profile line, which is regarded mostly as the result of inbreeding, but as for the Hungarian cattle it is mainly due to the brachyceros influence. The shorter-than-usual nasofacial part of the head is considered to be a characteristic of a faster-growing type.

### Horns

The breeders of the Hungarian Grey cattle often preferred animals with nicely-shaped horns even if their conformation was not perfect. This breeding was not right in those days, today, however, we have to take into account considerations of this sort in the case of the Hungarian Grey cattle as the shape of the horn greatly affects the overall impression one might have of a herd. The selection for aesthetic traits is to be considered one of the main objectives of breeding.

Apart from the colour, the following characteristics of the horn are to be judged: length, diameter, shape, surface and the shape of its cross-section.

Generally, we have a preference for long horns; a too short horn is regarded as a faulty breed characteristic. The horn of a bull is usually shorter, but even so, horn length must exceed the length of the head. A bull with too long horn is not favoured as it reduces the visual effect of sexual characteristics. The horn of a cow is longer and thinner; oxen have the longest horns.

We refer to an excessively thick horn as one being heavy, while a horn which is too thin is referred to as a light one. A heavy horn, particularly in cows with finer constitution, is regarded as a fault of conformation as it gives them a more heterogeneous character. The horns of bulls may be thicker being proportionate to their size, but a too coarse horn is considered a flaw of conformation with bulls as well.

When judging horn conformations, an important factor is the distance between the horn basis. This determines the horn conformation, along with the head characteristics and is vital from the point of view of the overall impression pertaining to the animal itself. The horn type regarded as one being in conformity with the original primigenious character and is equally considered nicely-shaped is the one pointed sideways in the first place and only then does it take an upward direction. Long horns stemmed in a broad basis

### SPECIAL HORN SHAPES I.

(the unusual Hungarian "folk-terms" are untranslatable)



*"búbos szarv"*



*"balog szarv"*



*"lapos szarv"*



*"villás szarv"*

and with an air of aesthetic harmony in shape are referred to as long horns.

Horns pointed directly upwards or backwards from their skull basis are not considered acceptably nice.

The most important horn shapes are the following:

The horn that grows outward and, bending downwards, does not rise above the level of the poll, is called moustache-shaped horn. The short version of this shape pattern is referred to as “wisp” horn. The former one is not popular as it “gives the animal’s head an air of stupidity”. The latter one, in the case of young animals, is regarded as advantageous because it has the potentials of broad horn basis and an outwardly horn shape. Straight-shaped horns rising hardly above the plane of the poll are named “spitty” (nyársas). Breeders in the Hungarian Plain did not like it. Tabular (táblás) is the name of the horn conformation grown more aside than upwards and having a nice, wide-arched shape. This conformation is very popular, especially in the regions beyond the Királyhágó. As for bulls, this might be the most attractive horn shape. If the arch is narrower, the horn is referred to as “tülkös” (horny in the swineherd’s pipe sense). The basis is often not broad enough, which unfavourably affects the shape of the horn. If the “tülkös”-shaped horn grows from the frontal edge and its tips are pointed more or less against each other, it is called “kukora” (oviform—egg-shaped). This is considered a flaw in horn-shape.

One of the nicest horn conformations is called “csákó” (shako). The name is associated with patterns of shape where the horn sets out horizontally from a broad basis, then turns steeply upwards almost perpendicularly with tips pointing aside outwards. If, instead of growing perpendicularly, the middle section of the horn turns outwards, the resulting shape will be one referred to as “gallyas” (twiggy). This is also a nice conformation and is a frequent one.

“Villás” (forked) is the horn with a more or less narrow arch that grows aside outwardly first, then continues slightly ahead then turns upward; its branches are more or less parallel. Narrow horns growing towards the rear are called “kecskeszarv” (goaty). Horns growing toward the rear and pointing downward are called buffalo horns, they are rare and are not regarded as nice.

The lyre-shaped horn sets out aside horizontally then hollows out and turns upward, turning definitely inward at the upper third before the tips, which point aside outward. This conformation can only be regarded as nice if the basis is broad enough and the horn itself is considerably long. What happens very often is that the basis is narrower than it should be, while the horn itself is not long enough, a conformation considered rather

## SPECIAL HORN SHAPES II.



*“csula szarv”*



*“salap szarv”*



*“gallyas szarv”*



*“zsákbabúvó szarv”*

unpopular. "Tulip" is a lyre-shaped conformation the branches of which do not hollow out to turn inside at the upper end; instead, they are almost parallel with the upper ends turning outward in tulip style.

"Balog" (asymmetrical) is a heterogeneous horn conformation resulting mostly from an accident. It can, however, be genetically passed on. It is a faulty conformation.

Twisted horn conformations are referred to as "pödrött", "pörge", "sodró" or "sodrott" (twirled). If the twist is only a partial one, the horn is referred to as one being twisted. If the poll is broad and the horns are long, the conformation might even be a nicely shaped one. Rare occurrence.

In addition to cardinal types, there are, of course, many transitional conformations as well.

After the clearing process, the horn surface should be glossy. Broken, decayed, or rotten horn is considered a flaw. Rough or striped horns often have cracks. Horn surfaces that are not smooth ones that are porous or cracked are also known as chapped, cracking or moth-eaten ones. The expression used most widely in connection with surfaces of this type is "moth-eaten". Formerly, "moth-eaten" horns causing sometimes the fracture of the horn, were thought to be living in the gaps of the horn caused by saprophytes. Its treatment by creosote was an efficient way of disease prevention.

The cross-section of the horn is always circle-shaped. An oval-shaped cross-section is the sign of some unknown crossing which occurred earlier.

We do not put horn-rackets on the Hungarian Grey cattle. The three-year-old bulls have a brass knob at the tips of their horns, partly to prevent bulls from hurting each other, partly to protect the tips from becoming fringed as a result of their tossing soil with the horn.

## Neck

The Hungarian Grey cattle mostly have a long neck, but it is often thin and poorly muscled. The yoke edge is protruding. The bulls sometimes have a loaded neck, which is not particularly preferred. Although the proper muscling of the neck is not belonging to the breed characteristics, animals with strong muscles should be preferred when selecting them. Muscles are generally an integral part of selection and we prefer the toughness to the voluminous bundles of muscles. A short neck is regarded as a serious imperfection.

## Dewlap

The dewlap of the Hungarian Grey cattle is large, which is visible particularly in the bulls. It extends over the sternal region between the forelimbs.

As a result, the exact measuring of the heart girth is often hindered difficul-

## ANCIENT NAMES OF HORN SHAPES

(untranslatable)



*“rengő, lombár”*



*“nagy csákó”*



*“sodró”*



*“fűrő”*

ties. A well-developed, fringed dewlap is preferred particularly in the bulls as it endows the cattle with an air of greater size and mighty appearance. Cows' oversized dewlaps reduce the effect of sexual characteristics with bulls. In the herdsman lingo, an animal with an oversized dewlap is referred to as one with "too large a shawl". Cut-out or too small dewlaps are considered signs of a flawed appearance.

### Shoulders and withers

This is an important region in draught animals. It is regarded as well-shaped when it rests on a slanting, one that is tense, well muscled and long shoulder-blade. The shoulders and the shoulder-blade of the Hungarian Grey cattle are generally flawless in appearance. A problem recurring most often is the poor muscling. Lax shoulder-blades are exposed to serious criticism. It occurs mostly with old cattle. The Hungarian Grey cattle often have protruding withers. This should be regarded as part of the characteristics of this particular breed, while less protruding withers are considered as a type variant rather than a flaw.

### Back

Perfectly straight line of vertebral column is a rare occurrence with the Hungarian Grey cattle and, in general with all breeds of Podolian origin. Because of the withers being high or slightly protruding, and the sacrum also protruding wherefore the rump bone is also high, while the back, between them, is lower, all these are resulting in a bended line. If the spinal vertebrae are joined firmly to each other, this is regarded nothing more than a slight flaw. If the joining of spinal vertebrae is not a spectacularly firm one, it is not even a flaw. What is really regarded as a serious flaw is the vertebral column itself being too soft, bent concave and the unevenness of the backbone is not exclusively due to the unequal length of the spinous processes.

The difference between these two formations is detectable mostly during the locomotion. The soft backbone structure of young cattle can considerably harden during a single grazing season. Interestingly enough, soft backbones, which might be subject to criticism, are much more common with bulls than cows.

Often occurring flaws pertaining to the formation of withers, backbone and the groin are thinness and poor muscling. In this case, the muscles are strong, but they are unsatisfactory in volume.

### Groin

The groin area is generally long enough, it is medium-wide and lacks the desired volume of muscles. It is difficult to say whether the lumbosacral is tense enough as the upper line is often not up to required standards—even if the lumbosacral joining is perfectly tense—because of the protruding spinous processes and the sacrum. This can also be best judged by the gait of the animal. The hollow of the flank of the Hungarian Grey cattle is generally quite large.

### Rump and thigh

The hindquarters conformation of the Hungarian Grey cattle is mostly straight, it is considerably long, it is poorly muscled and narrows rearwards. Seldom is the upper line of the rump nice-looking. One can often see the so called showy rump (“cifra far”) a conformation resulting from unequal length and direction of spinous processes. The sloping rump is a rare occurrence, however, poorly muscled, peak- and roof-shaped rumps are rather frequent. In lateral aspect the rump and thigh often appear nice and richly muscled, but even so, viewed from the rear, the muscles in most cases seem to be lacking volume and the gap area is situated too high due to the narrow bony basis. This problem is paramount and can be regarded as the most characteristic flaw of this breed.

### Tail

The long tail reaching below the hock is characteristic of the Hungarian Grey cattle. A thickly tufted, long tail, which almost reaches ground level, is especially favoured. Highly-set, front-fixed tails are frequent. Too short tail is considered a flaw in the characteristics of the breed in question.

### Chest

The chest of this breed is not wide enough, but is deep and long. A shallow chest is, therefore, more seriously criticized than the one which is not broad enough. Generally speaking, the breast is broad enough and suitably muscled. The narrow and poorly-muscled breast is regarded as a serious flaw.

### Abdomen

Its size varies, depending on the management. In wintertime, a wizened abdomen resembling a greyhound belly can often be found with some animals that are otherwise characterised by a large belly in summer. A big belly is vital for the grazing cattle in order to be able to take up enough energy even from a lower-quality, dried-out forage. In judging the slaughter weight,

however, it is a disadvantage. Therefore, sometimes even cows with good body condition are only assorted to the 3rd or 4th quality class.

### Reproductive organs

Generally speaking, there is no flaw in the conformation of these parts of the body; the only problem with older cows is, sometimes, the vulva being almost horizontally positioned.

### Udder

Mostly small-size, thickly haired udder termed "herd udder". At the same time, some cows right after calving often have fairly nice, rather large udders which appear to have the potential of producing a large quantity of milk. This, therefore, is a more suitable time to classify an udder. A noteworthy characteristic of the udder conformation of the Hungarian Grey cattle is its symmetry. Dead teats can sometimes be found on the udder. The blocking of a teat is not a substantial handicap in the total milk production of a cows with only one functioning teat are to be culled because of declined production.

### Legs

The upper part of the limbs is an area of tough muscles, which are, however, not substantial in volume. The joints are dry, and they are not too large sized. Even old cows often display "joints as lean as the glass". The texture of horny capsules of the legs is extremely resistant.

Irregularly set legs are a frequent occurrence; what happens quite often is that the hind legs are slightly sword-shaped and bandy. This conformation is particularly clumsy if the crus is long and the femur is relatively short. There is no evidence whatsoever that a flawed leg structure entails earlier wearing out. It is more likely that the texture of tendons, bones and muscles plays a more important part in the durability of limbs than the visible connections and joint angles.

Even in the case of culling 15-16 years old cows, those animals are seldom slaughtered owing to some limbs-related disease or some chronic limping pertaining to a disease of this sort. What more often happens is that cows are sorted out on account of fractures and injuries or flaws resulting from external traumas. At the same time, flawless, clearly-shaped joints and a long ground graining pace are all important conformational requirements. Apart from the fact that it affects the functional value of the draught-oxen, it is generally accepted that the breeding of animals with an aesthetically acceptable leg structure is equally important.

A common flaw with bulls is the open hock, (termed in Hungarian: “karó” or “székállás”). This is, in many cases, an acquired characteristic as the burden on the hock due to the matings and fights between bulls is considerable. A normal-angled hock will become increasingly open, the leg will become almost entirely straight, and the animal will become permanently lame as a result of the synostosis of the hock bones. It is difficult to judge how far a particular animal’s fighting character and the resulting increased burden on the joints are responsible for this distortion, or if it is the consequence of a genetically determined looser texture in the tissue of the tendon.

A “toeing out” leg setting (i.e. phalanges turned outward round their axis) occurs sometimes, but the opposite situation is extremely rare in Hungarian Grey cattle. Soft, pastern is almost non existent.

### Movement

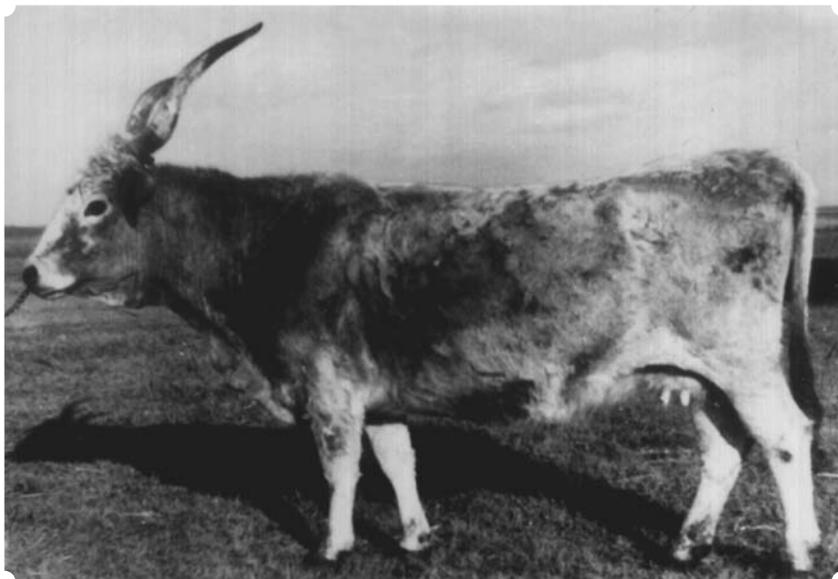
Much more attention should be paid to the movement of the Hungarian Grey cattle than to that of other breeds. It is vital that the animal to be judged should move briskly with the correct forward motion of the legs. A small-scale inward movement of the legs is detectable with bandy-legged animals. Most Hungarian Grey cattle can, however, be classified as such ones possessing a correct locomotion.

### *Types*

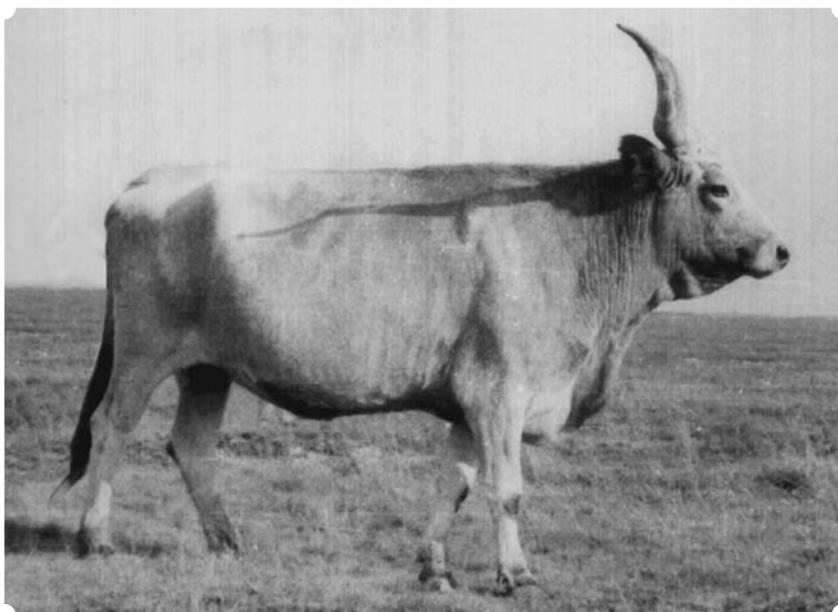
4. 3.

---

The breed of Hungarian Grey cattle is not uniform by appearance as it is characteristic in most primitive cattle breeds. The different types and even sub-categories of this particular breed were thought of as much more important variants a few decades ago than they are today. Their survival is, however, desirable, if it is still possible at all. The continued maintenance of these types was becoming a problem given the fact that most part of the total stock was bred in more or less similar circumstances in large-scale farms, while in the years prior to that period the different breeding practices of different regions had also greatly affected the appearance of the animals, while breeders also had their individual taste in creating individual types. The emergence of private farmers might, in this respect, bring about some positive change. The different types of the Hungarian Grey cattle are mostly distinguished on a historical basis. The small holders’ type was, for example, an animal with small body size, adapted to dire poverty, while the cattle raised on large, pre-war estates were affected by large-scale farm conditions. Cattle in the former type were draught animals simultaneously used for milk production, while

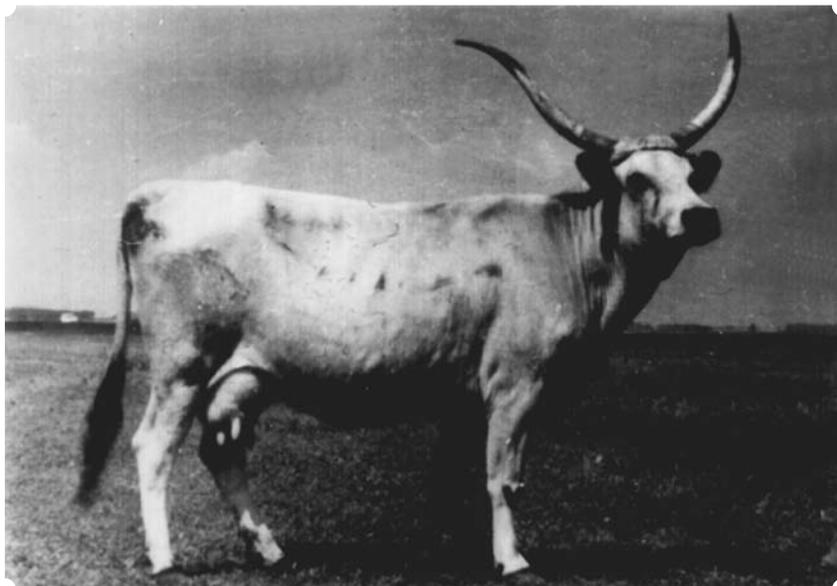


28 Ácsorgó. *Primitive type cow*

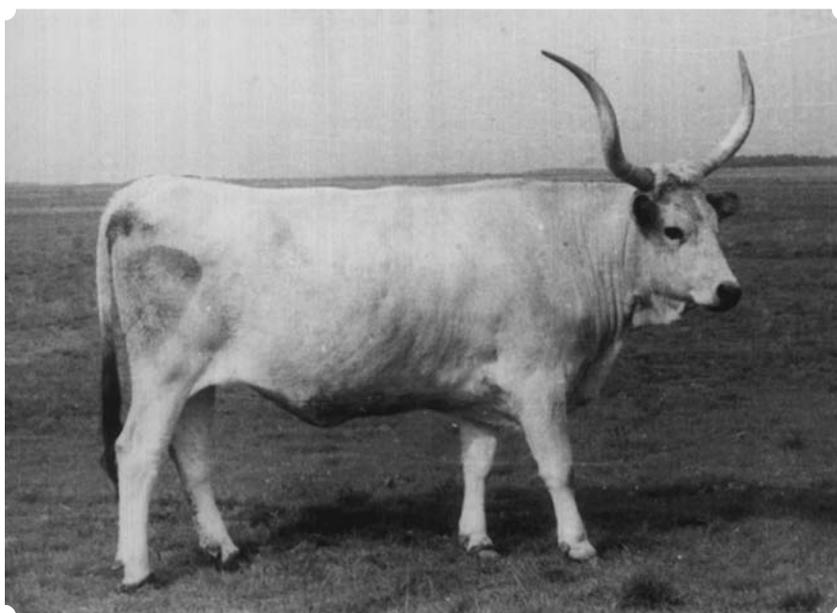


313 Ráncos. *Bulky, coarse constitution, draught-type cow*

Conformation of the Hungarian Grey cattle; types within the breed



190 Meszes. *A fine dairy cow character*



117 Hárca. *Large-scale farm-type animal*

animals belonging to the latter category were part of the herd, used mostly for nothing else than the production and sale of young bullocks. The cattle belonging to relatively well-off farmers was a third type in between the former two. The cattle raised in sandy regions could also be distinguished from the Grey cattle of those parts of the country where soil quality was better and production figures were higher. This classification has only historical importance now, although the survival of these types is desirable even today.

The breed of Transylvanian Grey cattle is by now an extinct sub-category. Compared to its Hungarian counterpart, this breed consisted of somewhat more corpulent individuals with shorter legs. Its horn was more widely arched, and achromasia was a more frequent characteristic of this breed variant. Experts in Hungary used to hold the view that the Hungarian variant had a more attractive appearance.

At the same time, the Transylvanian variant had a greater daily weight gain, and it had a smaller mountain variant as well. This breed variant had excellent production results, an annual milk yield exceeding 2,400 kg already at the turn of this century.

Today (i.e. from the 1930s onwards) the Maremman is the corresponding foreign breed which had an effect on the Hungarian Grey cattle without substantially reducing its own breed characteristics. The following characteristics are those indicating a difference from its Hungarian counterpart.

Its body is slightly bigger in size preferable beef characteristics. Its head is slightly longer, with mostly attractive looking white, long and light horns. The colour of the hair coat is identical with that of the Hungarian Grey cattle, although it has dark shades more often than do the Hungarian Grey cattle. Its hindquarters are wider and more muscular than those of the Hungarian Grey cattle; sloping rumps also occur occasionally, while irregularly set legs are rarely seen. Based on these characteristics, the Maremman stocks are easily distinguishable from the Hungarian Grey, although this might not always be the case with individual animals.

Further on, we will distinguish four types of the Hungarian Grey cattle. They were still existing types at the time when the cattle stocks of the large-scale farms—upon which today's Hungarian Grey cattle population is based were brought about. Since then, it has become increasingly difficult to come across some of these types as uniform feeding techniques, fodder quality and breeder's preference is likely to result in a situation where the fourth type, termed "large-scale farm type" will outnumber all the others. It is still very important to describe and distinguish them from the rest as in an effort to preserve genetic resources it would be desirable to see to it that these types will not become extinct.

1. *Primitive type*. Cattle being small in size and heterogeneous, with flaws of conformation belong to this type. Wantlessness and late maturity are their main characteristics. Extensive and stingy feeding conditions brought about this type.

2. *Draught type*. Cattle of big size with coarse constitution belong to this type. Highly emerging withers, massive occiput and yoke-crest, long horns and correct set of the legs are the main characteristics of this “steer-producing” type.

3. *Dairy type*. Cows and bulls with refined constitution, and noble outlook brought about this type. Poorly muscled body, angular forms, and long thin horns are characteristic of these cows. They were never selected for milk production.

4. *Large-scale farm-type (Estate type)*. Animals with large body size, at the same time with noble appearance, flawless conformation and mostly with long white horns constitute this type. The twiggy or shako horn formation is desirable.

It is also to be noted that in today's large-scale farm conditions the measuring of animals would be a long and complicated process, therefore it is hardly ever done. The different photometry methods are promising and the measurements on many hundred cows are carried out by videotechnics. The so called VATEM digitalized picture method (RATKOCZI–MARÓTHI-AGÓTS 2003) proved to be very practical.

To judge cattle sizes, it is important to consider their condition, which particularly affects the hearth girth. On one occasion, the heart girth of 10 cows was registered as being 186.2 cm at the end of the winter period, while the measurement of the same cows in good condition at the end of the summer gave an average figure of 200.2 cm.

---

*System of judgement*

4. 4.

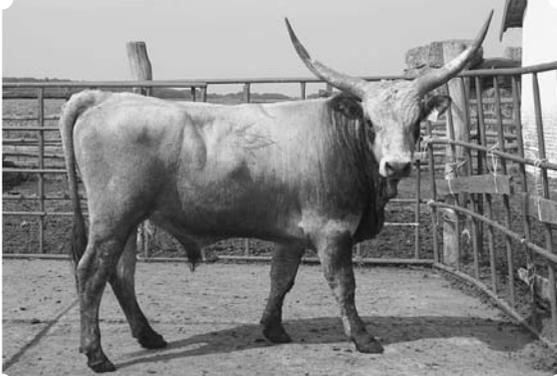
Attention should be drawn to three systems of judgement tailored to the parameters of the Hungarian Grey cattle. These are as follows:

The MNOSZ patent of the year 1954; the one prepared by WELLMANN in 1940; and the system of judgement prepared by Imre BODÓ and used in the Hortobágy State Farm from 1965 onwards.

These systems were adequate in those days; today, however, they cannot be used efficiently as they lay too much emphasis on details and are incompatible with the view that is globally paramount with respect to existing systems of judgement.

Conformation of the Hungarian Grey cattle; types within the breed

Therefore, the Scoring Card shown below, has been adapted to the needs of the Hungarian Grey breed; the evaluation should, of course, concentrate on the breed characteristics in accordance with what has been said so far.

HUNGARIAN GREY BULL SCORING CARD													
IDENTIFICATION NUMBER:	32085-0819-0			NAME:	VEZÚV								
EAR TAG:	819			LINE:	V								
BREEDER:	Tiszaigari Kft.												
BORN:	2001. 12. 28.												
RAISED:	Hortobágy			Scored in:	30. 08. 2004								
NATIONAL BULL NUMBER:	18356			by:	Judging Committee								
Trait	breed average	extreme formation	1	2	3	4	5	6	7	8	9	extreme formation	
<b>movement</b>	9	short walking											long free walking
<b>pigment</b>	9	insufficient											complete
<b>horn colour</b>	7	green											white
<b>horn length</b>	7	short											long
<b>hair colour</b>	6	light											dark
<b>body size</b>	7	little											big
<b>chest</b>	7	depthless											deep
<b>upper line</b>	5	curved											carp-shaped
<b>croup</b>	6	sloped											horizontal
<b>fore legs 1</b>	4	narrow, toeing out											wide toeing in
<b>fore legs 2</b>	5	bucked knees											calf knees
<b>rear legs 1</b>	7	arched hocks											cow hocked
<b>rear legs 2</b>	7	spindle legged											sickle-hocked
<b>constitution</b>	7	fine											coarse
<b>muscularity</b>	6	lean											well muscled
Weighed:	09. 10. 2002	weight: 255 kg	205 day adjusted weight:				192 kg						
	24. 08. 2004	570 kg	30 month adjusted weight:				538 kg						
Daily gain from weaning to the last weighing:	460 g / day												
Colour of palatum:				CONDITION:	k		TYPE:	u		CLASS: II.			
Remarks:	Well developed bull, with coarse head and still growing proportion.												
													

## ECONOMICALLY IMPORTANT CHARACTERISTICS OF THE BREED

5.

In this chapter we will attempt to evaluate the Hungarian Grey cattle in the three most important production characters, i.e. milk production, beef production and draught performance.

### *Milk production*

5. 1.

We have milk production data from an earlier period in connection with the Transylvanian cows, while in the technical literature in Hungary there are references to sporadic instances of registered milking, which give no adequate description of the breed's milk production characteristics.

1814 was a year when the milking of the Hungarian cows was introduced at Csongrád, and the results were in no way worse than those of the cows abroad. Their response to the conditions of draught was, however, better than that of their foreign counterparts. Their milk production was as much as 8-10 "mérő" (about 500-600 litres). Unfortunately, we have no data whatsoever concerning their feeding.

In 1827, Hungarian Grey cows in Magyaróvár produced 880 pints (1,250 litres) of milk. Another production figure (1,274 pints – 1,860 l) was regarded as an outstanding result.

In economical 8 pints of milk per calculations 1q of hay consumed, in the case of Hungarian cattle, and 11.5 pints of milk in the case of Tyrol cattle are calculated. (ÉBER 1961).

In Szolnok county, a society was formed in the 1860s to breed the Hungarian Grey cattle for milk production, but there is no further data in respect of the society's business operation.

In 1878, 54 Hungarian Grey cattle of Mezőhegyes produced an average of 840 l milk, —exclusive of milk for the calves— in the course of 210 days.

There is data in the literature indicating an extra 300 l of milk per cow in favour of the red Simmental, other data set the difference at 400 l for small holder farms, 500 l for medium-size farms and around 800 l large-scale farms.

The Hungarian Grey cattle breed

*Tízszázötven év adatai a 1935-ös évről a kisgazdák állományának teljesítményéről*

Hajdú county     16 Hungarian Grey cattle 1094 l milk  
Szabolcs county 13 Hungarian Grey cattle 1306 l milk

Hajdú county     482 Hungarian Simmental 1984 l milk  
Szabolcs county 647 Hungarian Simmental 1716 l milk  
produced on the average.

At the same time, in Hajdú and Bihar counties, where the conformation of the Hungarian Simmental cows was an indication of the higher percentage of crossbred characteristics from the Hungarian Grey cattle, the proportion of cows producing milk with more than 4% fat was 46% and 54% respectively, while the national average was as much as 18% for the estate and 40% for the small holders' stock. In Vencsellő, some Hungarian Grey draught cattle produced 2,580 l of milk with a fat percentage of 5.5%.

VUCHETICH (1935) gave an account of an experiment in which the Hungarian cattle produced 12 to 17 l of milk, while even 5-6% of fat was registered in milk produced in excess of 4,000 l.

According to some data in the technical literature, the Hungarian Grey cattle will put on weight rather than respond through higher milk production to higher standards of feeding (HEGEDŰS 1891). Pál BATHA gave an account in the 1935 edition of the "Farmers' Journal" (p. 248.) of the fact that in Eger, a capital cow by the name of *Ákos*, property of the capitular estate, produced 23.5 l milk, while the first-calved heifers produced 9-10 l milk. A cow named *Túzok* of Mezőhegyes produced 4,191 l milk with a percentage of 4.9% fat in the course of 365 days; the milk production of the first-calved Hungarian Grey capital cows was mostly above 2,500 l. Our manuals and textbooks put the milk producing capacity of the Hungarian Grey cattle at 800-1,000 l.

The above data seem to differ greatly in their figures. It is impossible to tell for sure whether the production capacity of this breed is genetically determined, or caused by the huge difference in their feeding conditions. It can still be said that there were cows with a high production capacity as well as a great number of cows with a low production capacity.

Unfortunately, we do not have comparative experimental data in connection with the milk producing capacity of the Hungarian Grey cattle, although some conclusion can still be drawn from the milk production results over a few years at two farms, one at Hosszúhát and the another at Ohat. (See tables 6 and 7)

Table 6

*The milk production of the Hungarian Grey cattle at the Hortobágy State Farm*

	Y e a r s a c c o u n t e d f o r				
	1952-53	1953-54	1954-55	1955-56	1956-57
No. of 1st year cows	64	128	126	117	102
Production days	227	231	239	247	228
Milk produced (kg)	1,530	1,600	1,893	1,929	1,730
Fat produced (kg)	71.2	72.6	83.3	86.0	78.8
Fat (%)	4.6	4.5	4.4	4.5	4.6

Table 7

*Hungarian Grey cattle milk production results at the dairy farm of Hosszúhát*

	Y e a r s a c c o u n t e d f o r		
	1953-54	1954-55	1955-56
No. of 1st year cows	50	49	60
Production days	189	232	247
Milk produced (kg)	1,611	1,733	1,963
Fat produced (kg)	70.4	81.3	93.0
Fat (%)	4.4	4.7	4.7

The best milking performance was achieved by a Hosszúhát cow named *195 Zsuzska*: 4,179 kg in 294 days with 205.2 kg butterfat, 4.9%. The best first-calved performance was achieved by the cow of the Ohat S.F. named *427 Adó*: 3,155 kg milk and 157.1 kg butterfat, 5% in 300 days.

In assessing these figures, three additional remarks are to be made:

– The above results were produced in such management and feeding conditions that are by no means considered satisfactory by today's standards. In the summer period, it was the grazing land that provided most of the fodder with some additional feed coming from elsewhere. In the winter period, hay and beetroot slices along with corn-stalk played an important part in the feeding of cattle. Feeding by fodder was a general feeding technique. There is every chance that better concentrates quality and more advanced feeding techniques might have resulted in better production.

– The cows which were not suitable for milking for reasons pertaining to the temperament of certain individuals, or those whose milk let-down

could not be reached without the simultaneous feeding of their calves, or those that went dry immediately following the weaning of their calves are not included in the herd-book (i.e. are excluded from the above data). This, however, reduces the reliability of all such data.

– The herd consisted of individuals purchased or raised locally, which had not previously been selected for milk production.

As opposed to data included in the manuals (800-1,000 l), the above data is an indication of slightly higher production potentials of this breed. 1,600-1,800 l would have been a more realistic figure; moreover, in order to reach an approximate production figure of 2,000 l, no particularly strict selection within the herd would have been needed.

Based on the above data, we can draw the conclusion that new lines within the Hungarian Grey cattle breed with milk production potentials the dual purpose cattle (3-400 l) might have been created. Today, with our cattle stock reduced both in quality and in number compared to the average figures of the past, the starting of an improvement project in order to reach this standard would, of course, be unrealistic. The milk production potentials of the present cattle stock fall considerably short of those of breeds specialised for milk production purposes, therefore we should concentrate on potentially valuable characteristics exploitable in specialised beef production.

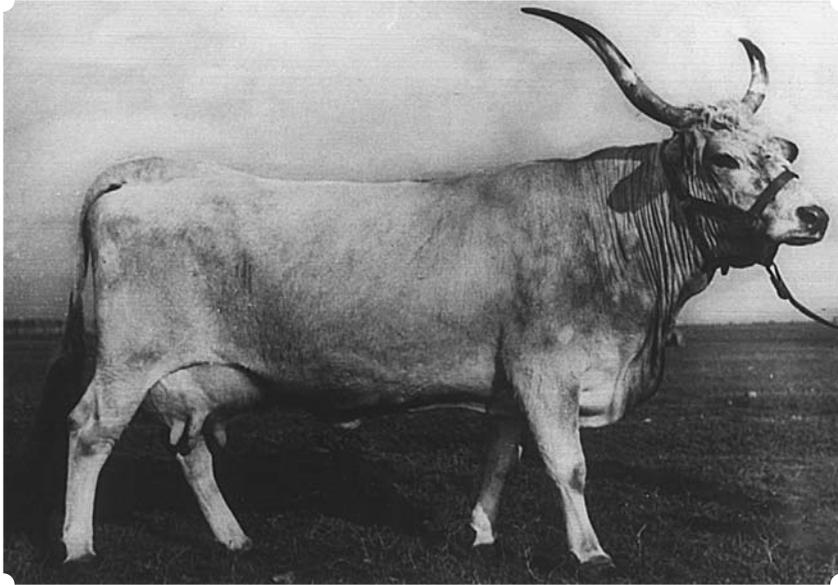
*Evaluation of the Hungarian Grey cattle  
in specialised beef production*

5. 2.

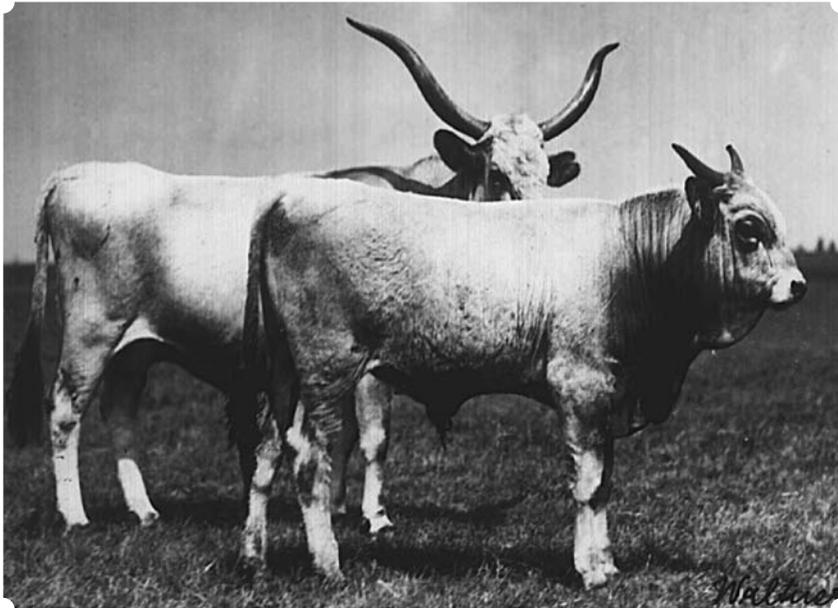
---

When judging cattle breeds specialised for beef production, we should distinguish between characteristics regarded as important from the point of view of economy of management of the maternal stock, and those which have an effect on the terminal product.

Economically important characteristics of the breed



117 Anna from Hosszúbát. The high milk production of Hungarian Grey cows is an exception



*The breeding goal of today is the good mothering ability*

Requirements to be met by the maternal stock:

- great yield, through
  - a) excellent fertility
  - b) good mothering ability
- low costs, through
  - c) resistance
  - d) wantlessness
  - e) good herd tolerance
  - f) good grazing ability
  - g) economic size
  - h) early maturity
  - i) calving ease
  - j) longevity
  - k) manageability

From the point of view of these requirements the Hungarian Grey cattle shows the following picture:

a) Fertility as a breed characteristic is difficult to judge. The number of the calves born is mainly determined by external, non hereditary factors (like the weather conditions, feeding, problems of micro element supply, human-, subjective mistakes, different management technologies, etc.) Therefore it is not possible to provide an average figure being characteristics of this breed. There was a fertility ratio above 90 % and much worse as well. There are cows delivering 9-10 calves in 10-12 breeding years, others omit some years. Hungarian Grey cattle are usually regarded as a breed conceiving with certainty.

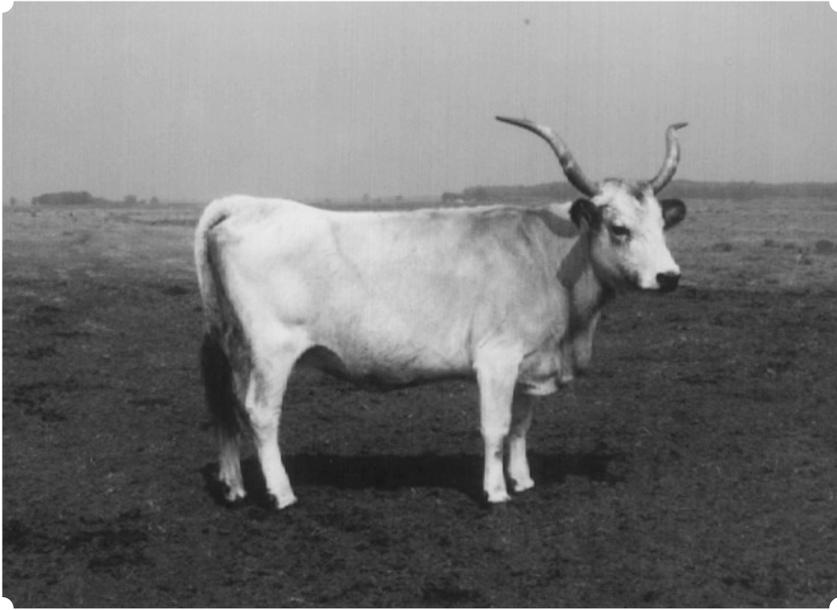
b) Mothering ability can be characterised in numbers, based on the data available.

Untreated pasture and no grain-feed gives an average weaning weight for the calves of 180-200 kg. Under very good conditions the biggest bull calves reach or even exceed 300 kg. It is rare for a cow to refuse her calf. Some farms reach an average live weight of 220 kg corrected to 205 days of age in a series of several years. Standard live weights can be found in the chapter on herd book and registration.

d) Hardiness of the breed is well known. No numeric data can be given on this for no comparison was made under experimental conditions.

It is a fact, however, that Hungarian Grey cows have a good condition even on the dry, barren summer pastures and they do not have any special demand with regard to the quantity or quality of the winter feed. This

Economically important characteristics of the breed



*3 Csengős 52-year-old cow of Városföld State Farm.  
The longevity and many calves are valuable traits of the breed*



*A Team of six oxen of the Középtisza State Farm.  
The breed gives excellent oxen, beyond all question*

also means that a transient loss of condition is taken much better by them and in a period with better feed supply they improve readily. Of course, even Hungarian Grey cattle cannot be kept quite without fodder as the laws of biology apply to this breed as well.

e) Good herd tolerance. The breed has been kept in great herds for centuries and therefore it stands mass rearing excellently. No single case is known where a cow would have had to be sorted out for this reason. A chased away bull is mostly the fault of the herdsmen as well.

f) Good grazing ability. This cattle eat (in lack of anything else) reeds and survives on weak pastures as well. The grazing period lasts from the beginning of April till the fall of snow. It happened that cows were driven out in March and grazed till the beginning of January. Corn stalks belong to the best winter roughage of the breed.

g) Low live weight is usually regarded as a main criterion of low cost beef cow. Under harsh conditions this is not exactly true for in this case you cannot accurately calculate the nutrients for body weight unit. Periodical starvation is endured not by body size much rather by storage capacity. A decisive characteristic is that the animal be able to store enough suet during ample supply of grass for periods with more stringent availability. Hungarian Grey cattle are outstanding in this respect.

Body size is between 450-650 kg and is dependent on body condition to a great extent. More voluminous body with somewhat less live weight might be the basis of good crossbreeding combinations.

h) Early maturity. Hungarian Grey cattle are widely known as a breed of slow maturity. This however depends to a great extent on breeding conditions. In general, two thirds of a heifer stock is suitable for breeding by the age of two years. Due to keeping the breeding season, mating before this is usually not done. (As a matter of fact, the most important factor is not so much the time of first delivery, much rather how much costs are attributed to the heifer until that point and this puts the issue under quite harsh conditions into a quite different light...) Even two-year-old heifers have delivered calves before. It happened several times that a Hungarian Grey bull calf of 8-10 months covered successfully.

i) Calving ease. Calving difficulties are very rare in this breed. This is meant that cows deliver entirely without human assistance in 100 % of the cases. It needs further research to determine how much this beneficial characteristic is passed on in crosses. Practical examples seem to prove that Hungarian Grey cows delivered calves from Charolais bulls also without assistance.

j) Longevity. It has great significance when there is much difference between the market value of the young beef cattle and the culled cows and

cows can be kept substantially cheaper than heifers. With Hungarian Grey cattle usually this is the case. Hungarian Grey cows are still fertile at an age of 15-17 years and rear their calves nicely. The only revealing sign is a weaker condition during winter. The longevity could be increased significantly in case of improved winter setting in smaller groups and better management conditions. There were years when cows older than 10 years were 50% in proportion in the herd of the Hortobágy State Farm. Certainly this characteristic is also a function of the stock rotation. Record is kept by the cow of the Városföld Farm named *5 Csengőv*, having lived for 32 years and delivered 27 calves.

k) Under free ranging, tough conditions Hungarian Grey cattle are easy to manage. Cunning animals, adopt to keeping conditions easily and learn the habits soon. Sometimes there is a cow which attacks when her calf is touched by strangers. When tied up, they are more demanding in terms of herdsmen than the Hungarian Simmental due to their agility, horns and kicking ability. In certain farms bulls are not provided with rings and they are kept free in groups.

*Beef characteristics of the Hungarian Grey cattle*

5. 2. 2.

When producing terminal products, the following characteristics must be taken into account:

- a) daily gain to be attained and utilisation of feed
- b) beef performance ratio
- c) beef quality
- d) attainable weight, terminal weight
- e) beef forms
- f) beef-bone ratio

a) In a comparative assessment study 7 Hungarian Grey cattle bulls achieved 891 g daily gain during a feeder period of 300 days, as opposed to 1039 g of the control Hungarian Simmental. In this respect variability is great. Under traditional conditions a daily gain exceeding 1,000 g is also possible. In 2002 in a feed lot experiment Hungarian Grey bulls were proved to be competitive compared to *Holstein-Friesian* ones.

b) Not many data are available from test slaughters. A carcass weight exceeding 58 % is known in the case of a steer above 500 kg.

c) No data are available to compare meat quality. Subjective experience obtained during slaughters support the notion that as a cattle breed which is greasing earlier, suet is not stored among muscle fibres, much rather under the hide and the body cavity.

## The Hungarian Grey cattle breed

d) Steers can be fattened easily up to 500-600 kg. In the study mentioned under a) carcass weight was 536 kg.

e) Beside great variability the most typical is bad beef forms in the case of the Hungarian Grey cattle. Particularly true is this for the lean and narrow rump.

f) In this respect the breed is good for it has particularly thin bones.

In summary, Hungarian Grey cattle as a breed kept for beef producing maternal stock has mostly beneficial characteristics, because: it can be kept under very simple conditions, not demanding in terms of feed and stable, good grazing ability, calving ease, longevity, resistant. Mothering ability is good with respect to rearing conditions. From a point of view of the terminal product (young slaughter steer) the breed is unfavourable, for gain and growth with the feed utilisation ratio given is not sufficient and beef forms are not good either, but this is mostly a problem when marketing alive.

Thus Hungarian Grey cattle breed is promising in terms of calf production under present conditions, even, but in terms of slaughter steers the Hungarian Grey cattle are not competitive against the best beef producers.

A quite different case is if marketing of good quality and high value beef produced under the conditions of organic husbandry can be done at a premium price. Otherwise the balance between beneficial maternal and less favourable feeder characteristics determines economic efficiency in proportion of attainable costs and benefits.

The direct slaughtering from pasture opens new perspectives of organic production, however it needs still research for processing and marketing.

From this point of view Hungarian Grey cattle is considered to be one of the best in the world both in practice and the technical literature. Due to their agility, effective movement, hardiness and longevity Hungarian Grey oxen were always highly appreciated as draught animals.

HINTZ (1881) and BALOGH (1910) preach Transylvanian oxen particularly. There were many farms, which, though breeding Simmental cattle, yet used Hungarian Grey cattle for draft work. Several authors (EGÁN 1890, SPERKER 1911) remember times when it was cost effective for Czech sugar factories to purchase draught oxen from Hungary and particularly from Transylvania. They knew that when fattened they do not achieve the performance of Hungarian Simmental, yet they were regarded as excellent in draught work, that they purchased the best of bullocks from year to year.

There were others, who preferred Hungarian Simmental due to its fast daily gain (MAGYARI 1941) and stated that in case of good management conditions Hungarian Grey cattle were not indispensable at all (BALOGH 1910). Yet others insisted that Hungarian Grey oxen can be excellent supplement for machines, even (HORVÁTH 1955). According to the opinion of experts they can work 20-25% more than oxen of Western breeds (HORVÁTH 1955). They are able to spend 12-14 hours at work, while the corresponding performance of Simmental is merely 8-10 hours (HEGEDŰS 1891). A benefit over horse draft is that it can be kept cheaper, there is no need for high expertise and it has a better price when culled. MONOSTORY (1906) says they have the same performance as the Simmental, but move quicker.

It is typical of its wantlessness that Simmental oxen were given a kilogram more concentrate feed than Hungarian Grey oxen (FONYÓ 1943).

Authors agree on the fact that Hungarian Grey cattle are long-lived and they are able of working long. Some herds produced oxen which worked for 18-20 years (like the herd of the Count Kálmán ALMÁSSY, Senior). According to SCHANDL (1954) they were serviceable for 16-17 years, RUISZ (1895) puts this figure 12-15 and BATTHA (1935) 14-15 years.

When intending to fatten, it is appropriate, of course, to cull somewhat earlier. Some data shows the numbers of the Hungarian Grey oxen in Hungary:

1926	280.000
1935	190.000
1938	190.000
1942	212.000

After World War II also experience justifies these. It is known for example, how important a work was carried out by Hungarian Grey oxen during rice harvest, when carts had to struggle in deep mud sometime. Similarly difficult work was done by them during Winter feeding.

Excellence of the breed is unquestionable in this field, the question is however, whether a draught oxen is needed any more at all.

It is very much probable, that oxen will have no jobs any more on the crop fields. People working in agriculture have a declining number. It is impossible to employ so many farm hands as to do all the work in land cultivation by hand instead of the very few tractors and tractor drivers. Even if enough people would be available for this kind of work, the high salaries would make it very expensive.

There is only one sort of work, where there is a local significance of transport by oxen even at present, and this is winter feeding. The work cannot be properly mechanised as long as feedlots and farms are not supplied with appropriate internal road networks. On the tough roads depreciation of machines is quick.

This kind of work is easy to solve by oxen. It requires less care and cheaper food than the horse and is not demanding in terms of stable. In Summer it can be kept on pastures without any extras. When feeding is done by using oxen, it is also possible that no extra farm hand is employed, but tenders of the animals (shepherds, herdsman) themselves provide feed by using the oxen. In the case of scattered sheep-folds this is especially useful since oxen can be fed on the same feed stuffs as the sheep and they stand the usually cold building better than the horse. When a Hungarian Grey cow is yoked, a few litres of milk is also available which would otherwise be a difficult task to supply. Beside this as a side product a few calves are also produced which are effectively utilised in the farm kitchen. (Before World War I there were farms where only cows were used for power, and bullocks sold out at a good price (KOVÁCSY 1901).

Doubtlessly the Hungarian Simmental oxen had a better position to start with when sold after culling, because Hungarian Grey cattle had no good quality carcass when slaughtered at an advanced age. Under poor feeding conditions and in deep mud Grey oxen are so much more reliable than the Simmental ones (they will never go limp) that sometimes they were regarded as the best solution.

Certainly by the advance of large-scale farming and the internal road network the ox has lost its significance. However, many expensive machines could have been saved by a more intensive utilisation of oxen. In last years more and more Hungarian ox-teams can be seen in exhibitions and other show events.

## BREEDING WORK

6.

### *Selection goals in the breeding of Hungarian Grey cattle*

6. 1.

The selection goal in Hungarian Grey cattle breeding can be approached from two different aspects at present:

– Requirements raised for the breeds preserved as genetic resources (6.1.1.),—as this is the main objective of maintaining the stock.

– The breed can also be regarded as beef cattle for it produces also beef and nowadays low input systems grow in significance (6.1.2.) In the case of the Hungarian Grey cattle this aspect is particularly important when, beyond the gene conservation, we talk about the breeding of surplus stock.

#### *Breeding goal in the maintenance of gene reserves*

6. 1. 1.

Gene reserve maintenance must be carried out in a way that *genetic composition of the stock should not possibly change and should remain unchanged for posterity*. This implies a stock kept in genetic equilibrium. For theoreticians and scientists this means sufficient numbers and random mating, using as many unselected bulls in random matings as possible and 1:1 sex ratio.

This is theory. Practically, however

- it would mean falsification as the breed has never been kept like this
- practical implementation also, would pose insurmountable difficulties.

When merely as much happens as not all of the bulls are kept for breeding and bulls and heifers are not randomly (drawing lot) chosen, it is already selection. *It has to be firmly maintained that breeding of domestic animals cannot be imagined without some sort of selection*, since this would change the composition of the breed in a much greater extent than selection itself does, which is carried out in order to meet the selection goal set, that is gene reserve maintenance unchanged. Aspects need to be determined for the selection of replacement stock based on pedigree (A), conformation (B) and performance (C).

A) The most important requirement of unchanged maintenance is that fathers and mothers which are carriers of genes not perfectly known, had a possibility to supply at least one calf for the next generation. This certainly is easier to say than do. As a matter of fact, maintenance of genealogical lines and cow families is essential. Of course, strange breed can only be used for terminal cross. Crossbreds cannot get into the stock.

We are not in the business to prove at this point, why maintenance of the living stock of a breed (in situ conservation) cannot be substituted by storage of deep frozen sperm and eggs (ex situ method). Of course, the combination of the two is applied.

It is important to maintain the frequency of immuno-genetic traits and biochemical polymorphism (blood group, DNA, variances in blood and milk proteins), so an animal carrying a rare allele has to produce such a progeny which inherited the allele in question and is later put into service.

B) When carrying out judging of conformations it has to be kept in mind that the essential task is the maintenance of the most important characters of the breed so that not to loose possible variances (colours, types) and the taste of an individual breeder could not uniform or impoverish the shaping of conformations in the breed.

Ancient variances have to be dealt with as especially precious and favourable beef forms or white horns are not to be put into the forefront during selection.

The objective is thus to preserve for posterity all the colours and forms which are present in the breed today (except, of course, flaws in the breed character). The maintenance of different conformation characteristics (like green horns, twirled horns, dark-crane colour, big size oxen producing type, small size primitive type, etc.) is as important as that of biochemical polymorphisms.

C) Selection aiming at the improvement of performance includes serious threats when it goes about gene conservation. Those genes belonging to the primitive character which are the most precious characteristics of the native unselected breed can be lost and not maintained for the future—today unknown—requirements.

Therefore the monitoring and use of only such characteristics can be permitted, which are not contradictory to the main goal, i.e. maintenance of the character and vitality of the primitive breed. Thus regular oestrus, good fertility and calving without assistance are all essential. Good mothering ability is equally important, which does not automatically imply that selection should be done for great 205 days' weight, merely so much that the cow insist on her calf and nurse it soundly. In the case of bulls the libido and good fertility is to be accounted with. Gain in weight and great live weight, however, are not to be considered as objectives of selection. Definitely the preservation of the smaller primitive type within the breed has to be carried out as well.

*Breeding goal to be set  
for Hungarian Grey cattle raised for beef production*

With regard to individual beef production and beef forms the Hungarian Grey cattle cannot compete with beef cattle used in terminal crossing. To set such a breeding goal would have no sense even without taking notice of the principal considerations of the preservation of genetic resources.

It might be competitive, however, with regard to the requirements established in the case of maternal lines under free ranging conditions, that is in the fields of conception, calving ease and nursing of calves.

In herds being in excess of the number absolutely necessary to maintain the breed this can be allowed, the more so because these considerations outlined below hardly contradict to the considerations of maintaining gene reserves.

The following traits should be taken into consideration when a farm is about to carry out beef production using Hungarian Grey cattle:

***female stock:***

1. fertility, short calving intervals (a calf each year);
2. calving ease, no need for human assistance;
3. ability to nurse the calves, a great 205 day's weight. (Consistent selection for this characteristic cannot be done owing to considerations regarding preservation of gene reserves. Although some breeders can set such a breeding goal as well.);
4. resistance against diseases, endurance of whether conditions;
5. wantlessness and toughness: this trait is readily measurable in "low input" systems by the surviving calf and its body weight;
6. Longevity is very important in commercial herds.

***bulls:***

1. fertility: there should not be many return cows after mating;
2. ability and readiness of mating;
3. keeping of condition: the bull should not possibly be in a too poor shape by the end of the breeding season even without concentrate feed;
4. Longevity.

<i>The formation and role of lines in the breeding of the Hungarian Grey cattle</i>	6. 2.
<i>The professional interpretation of the concept of line</i>	<u>6. 2. 1.</u>

Line (“blood line”) can be used in three different senses:

A **genetic line** means the population or group of animals selected and inbred for an excellent ancestor, which all carry the traits of the founder of the line in a great extent.

A **genealogical line** means (usually only male) progenies of one particular sire on the paternal line. These individuals, according to the laws of genetics, resemble less and less from generation to generation the founder (name giving) male of the line.

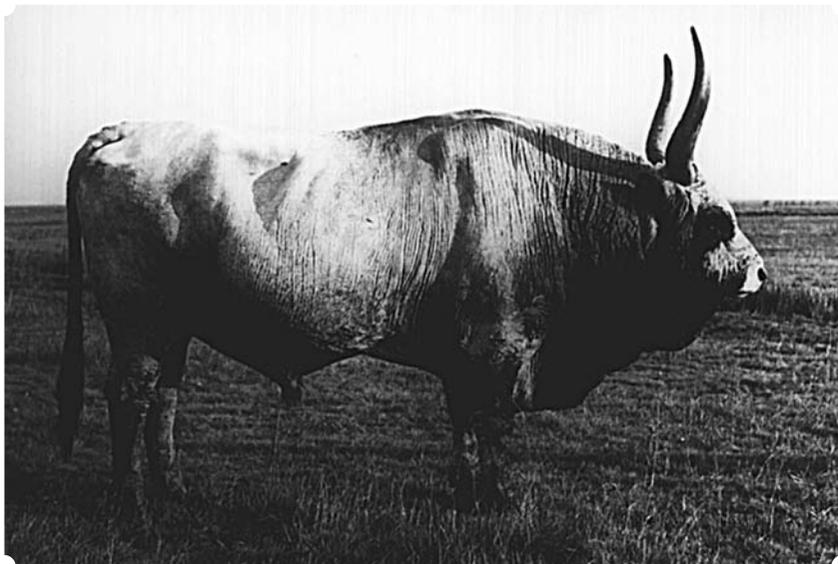
**Breeding line.** This notion is being used recently. It goes about a group of animals originating from an excellent male where the distinctive characteristics of the founder are preserved for a few generation through consistent mating and selection.

So far the breeding of the Hungarian Grey cattle was mostly done using genealogical lines. This means that animals belonging to different lines do not substantially differ from each other in a genetic sense.

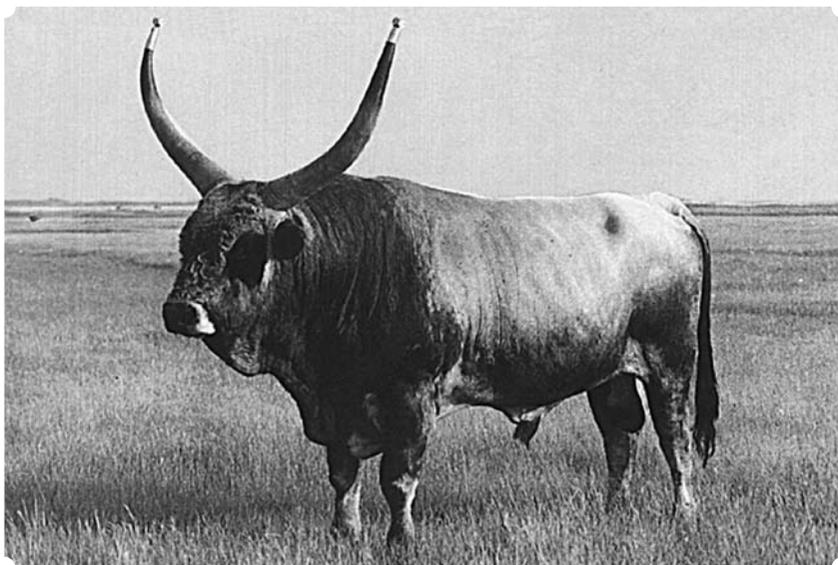
Founders of lines existing today were the following bulls:

- “B”** *Buckó* (born: 1945) Breeder: Gyula CSUTORÁS, Kismarja. It was the bull of the Hortobágy State Farm. The line was carried on by his son, *Buda* alone. Bulky, extremely noble and explicitly expressing his gender, he was a bull of green horns. Because of his gentleness he appeared on exhibitions in the fifties and sixties.
- “C”** *Betyár* (born: 1946) He was also a bull from Hortobágy, bought from Kismarja. His line was carried on by his son, *Csordás*. The bull was purchased from the Grazing Commission of Tiszacsege by the breeding farm. It was a bull with some feminine characteristics, narrow horn basis, long and thin white horns, a bit shallow, noble average beef forms.
- “M”** *Maros* (born: 1955) Breeder: László FEKETE, a farmer from Hajdúnánás. His dam was an excellent dairy cow, (300 day's yield: 3,760 kg milk, 4.2% butterfat) and this was the reason why the Hortobágy State Farm bought the bull. *Maros* himself (nicknamed *Tóni*) was a bull showing poor beef forms, mating excellently, fertilising very well, having extraordinary vitality and white horns. Many of his progenies were substantially greater in size and more muscular than the founder of the line.
- “T”** *Tuskó* (born: 1948) A bull raised at Máta, there is no exact information available on his pedigree. The breeder of this bull is not known. His excellent son was *Acél*. (All bulls in the “T” line are the progeny of *Acél*). Steely, agile, small in size, lean, green horned bull. He got from Hortobágy to Tarpa, then to Mezőnagymihály, later to the Középtisza State Farm. The line “A” is also derived from line “T” through the son of *Acél*, named *Árpád*.
- “V”** *Vándor* (born: 1948) According to the herd book entries he was a bull reared in Hortobágy, Máta. He was a white-horned bull with noble, correct conformation, moderate size, also attending exhibitions. His progeny were slow-gaining. On the paternal line it was merely *Vértes* to carry on. He was a green-horned bull with poorer conformation, fighting constantly. He had only one son remaining in the line: *Vitéz*. After this small sized, cream coloured, insufficiently smutty, white-horned bull it was difficult to raise a good herd sire, that is to maintain the line.

**THE LINE „B”**

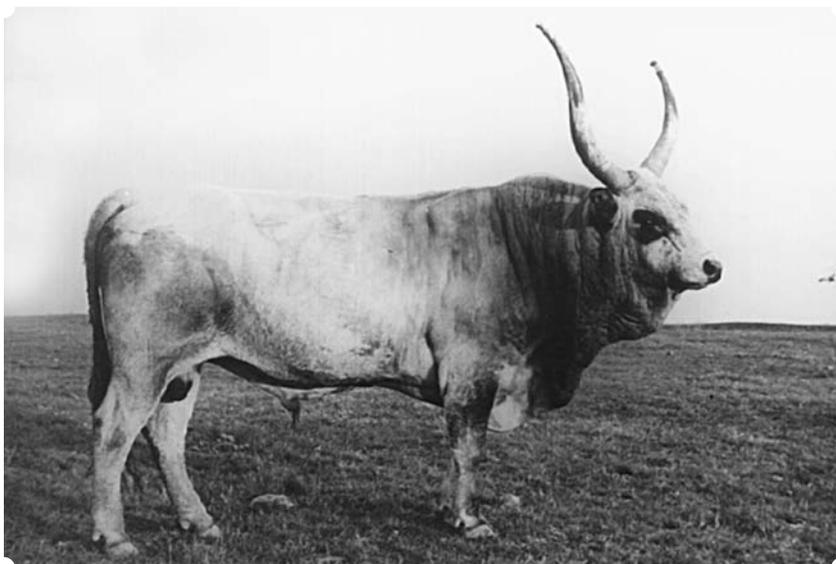


20 Buda 271/3

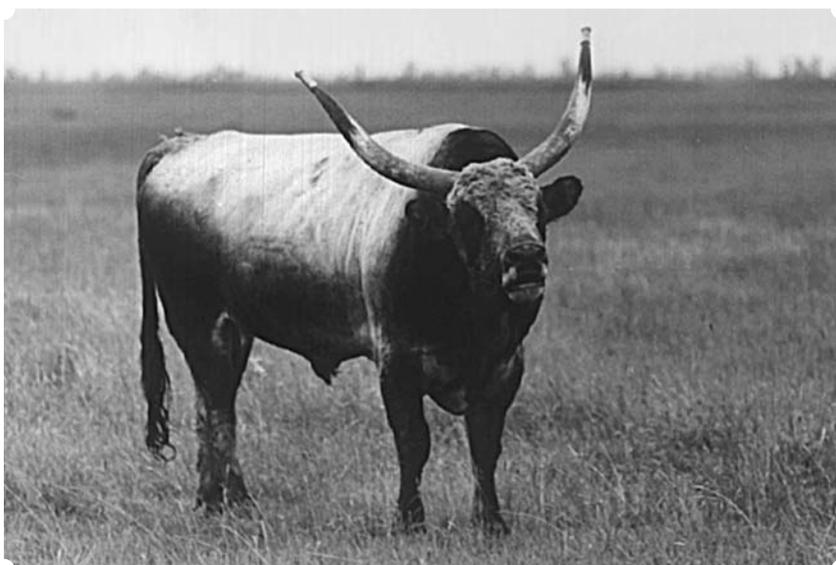


40 Bilincs 151/3

**THE LINE „C”**

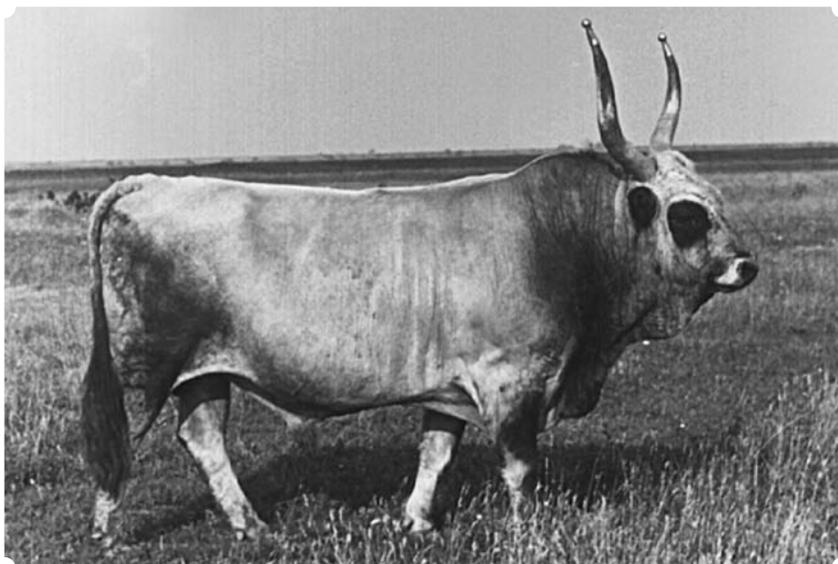


35 Csordás 215/4

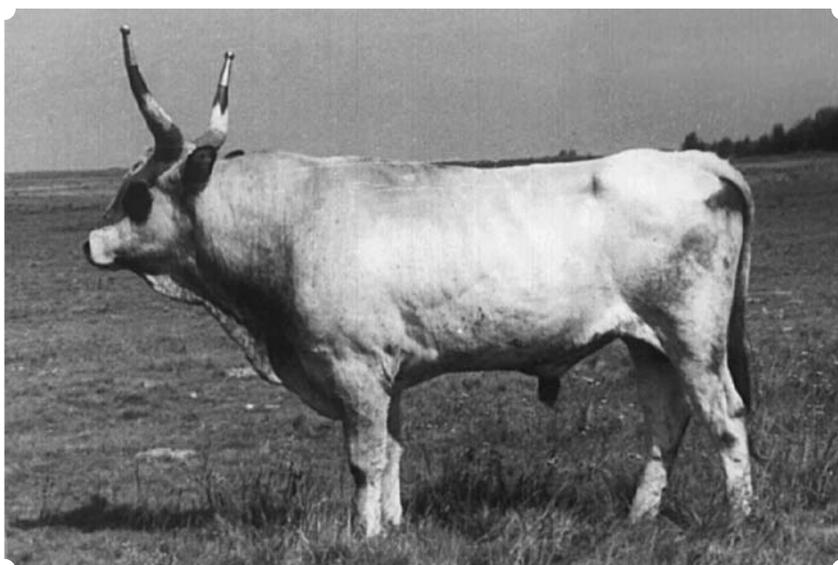


44 Csibész 162/4

**THE LINE „V”**

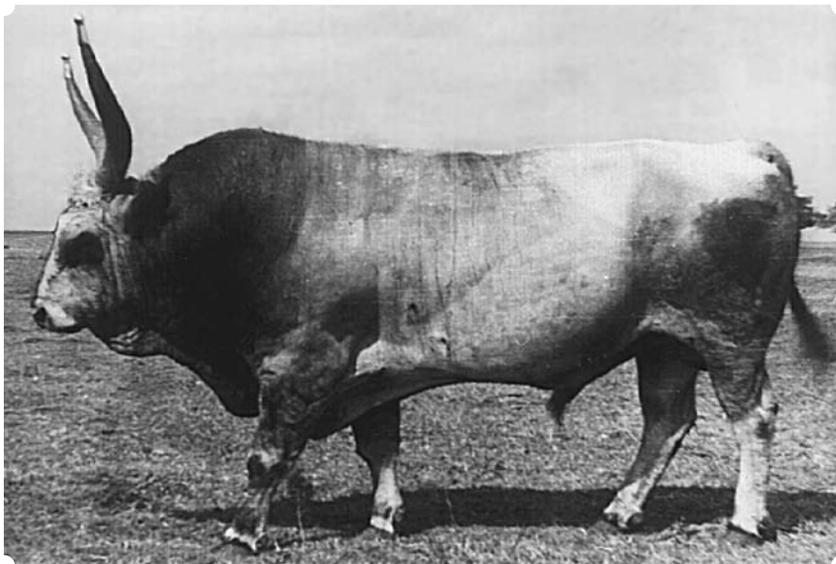


17 Vándor 78/8

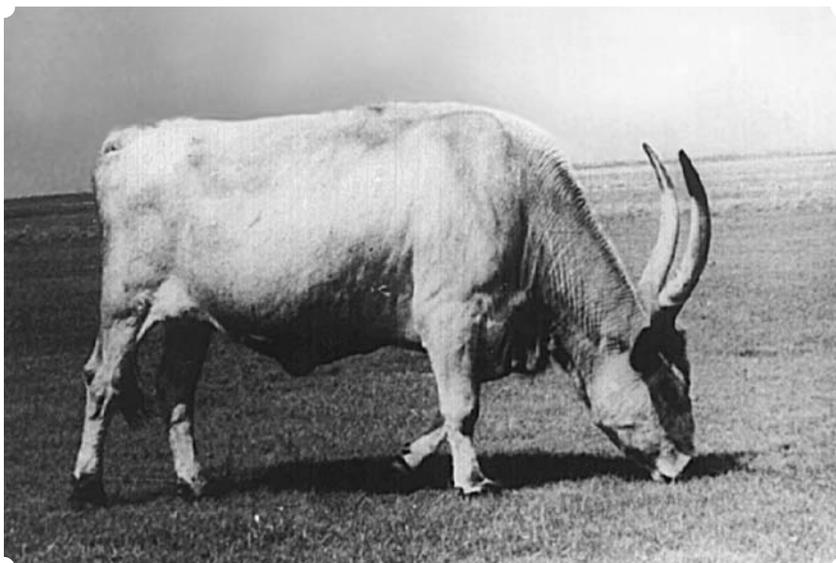


42 Vitéz 303/3

**THE LINE „T”**



28 Tatár 453/6



151 Dóra, *mother and grandmother of numerous herd sires*

- “**K**” *Bugac* was the bull of the Városföld State Farm. His son has got the name *Kujon* in the Középtisza State Farm, where *Bugac* was transferred in 1961. He was an average bull with moderate size.
- “**J**” This line was established by the *4614 Jumbo*. In general the character of the stock imported from Yugoslavia, — of which *Jumbo* was a member, — was criticized due to the short horns, pigment deficiency and small size of the body. The association is not intending to maintain this line.
- “**O**” It was established by *6794 Ottmar* imported from Austria, with acceptable breed character. The line is not important.
- “**R**” The founder *Rinaldo* (originally named *Bastellone*, born in 1970) suited best to the character of the Hungarian Grey cattle among the Maremman bulls. He was a bull big in size, with long-head, voluminous muscles long trunk, and slightly sloping rumps. He covered in the Hortobágy State Farm. *Rinaldo* had some breeding male offspring but the line is not maintained.
- “**E**” The founder was *Erode* (born: 1969), a Maremman bull. He served in the Városföld State Farm. Many dark progeny were born from him and he passed on the chromosome deficiency named 1/29 translocation.
- “**D**” *Digó* (Friolano, born: 1970) He was a Maremman bull imported by the Hortobágy State Farm. He was wantless with short trunk, excellent beef forms and dark colour. As all the Maremman bulls, he also wore wonderful white horns.

The fourth Maremman bull, *Carlo* had no male progeny.

The Maremman lines are not to be maintained, because of pure bred breeding reasons.

The first systematisation of genealogical lines is marked by the name of Alfonz ANKER. It was him in 1957 who changed the designation used that far, beginning with the initials of the year of birth and began to use the initial of the founder of the line in naming the bulls. He even renamed them if it was needed. Thus the bull formerly named *Bolygó* became *Vértes* and the son of *Acél* (first year) was named *Tatár*. As a matter of fact, the *Tóni*, bought from Hajdúnánás was renamed to *Maros*, because a line “T” already existed. *Csordás*, born from the third year’s progeny of *Betyár* carried on the line “C”, because a line “B” already existed (*Buckó*). Later the Hortobágy State Farm continued this system. When the National Inspectorate for Animal Husbandry (OTÁF), and National Institute for Animal Husbandry (ÁTMI) took over the responsibility of preservation of the “native breed” stocks, this genealogical line-system was adopted and further developed by the National Institute for Agricultural Quality Control.

Breeding work

From the stock imported from Vojvodina (Serbia) in 2003, two new lines were established:

- line "L" from Rado TISMA herd, Beska;
- line "S" from Szabolcs TRUZSINSZKI herd, Bácska-Topolya.

*Evaluation and use of individual lines*

6. 2. 3.

Combinations of lines rendered it possible during the first few generations to avoid close inbreeding. Using the sequential order of the lines a rotational system could be prepared. A combination of the lines could also be applied (like with lines M-T and B-V in Hortobágy). These however, did not represent a very consistent solution or the fixation of any of the lines through planned inbreeding. Beside making the systematisation of the bulls possible its benefit was the avoidance of inbreeding.

By today lines have reached their 8-10th generations. They got completely confused and it can be stated with certainty that the above listed genealogical lines of the Hungarian Grey cattle have no characteristic features and therefore form a pure genetic point of view no essential difference exist between them.

The statement said above is proven by the following pedigree:

Vezér	Vagány	Vőfély	Vitéz	Vértés	ap. Vándor
			11 Sete		
		823 Cakkos	Tüzes	<b>Tatár ●</b>	ap. <b>Acél ▲</b>
			5330 Cakkos	<b>Morgó ▼</b>	ap. <b>Maros ■</b>
	801 Rózsi	<b>Morgó ▼</b>	<b>Maros ■</b>		
			144 Mozsár	<b>Acél ▲</b>	ap. <b>Tuskó ◆</b>
		435 Rózsi	<b>Tatár ●</b>	<b>Acél ▲</b>	ap. <b>Tuskó ◆</b>
			42 Rózsi		

*Thus, this bull belonging to line "V" is inbred for the lines "M" and "T"*

The figure on p. 91 depicts three different bulls, representatives of the first three generations of line “M”. The pictures illustrate strikingly what kind of changes can be achieved using proper mating (and some tricks in management and feeding): among the progeny of the bull *Maros*, which showed truly primitive features, some were born within two generations which had an appearance as if they belonged to one of the British beef cattle breeds. Thus the line did not at all preserve the characteristics of the line-founder in its external appearance.

To cut it short, lines today are of no use any more in mating, they merely have some kind of role in systematisation. You should not think that belonging to one of the lines would be of any significance in conformations, performance or genetics. Its best use to provide guidance among the bulls. For mating purposes in itself cannot be used any more.

You must not conclude however that genealogical lines would have no significance in maintaining the breed. The gene frequencies of all the Hortobágy and the entire inland stock was strongly influenced by the line founders. JILLING (1986) calculated the role of the line-founding bulls in the pedigree of this stock and his results are presented in the following table:

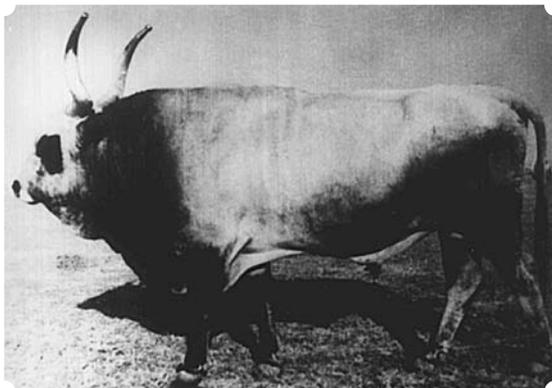
Table 8  
*Gene frequency of founder bulls in Hortobágy stock*

founder bulls	g e n e f r e q u e n c y		%
	bulls	cows	
<i>Maros</i>	11.81	12.23	12.02
<i>Tuskó</i>	5.99	6.41	6.20
<i>Kardos</i>	7.29	5.10	6.19
<i>Betyár</i>	4.86	4.54	4.70
<i>Buckó</i>	5.03	4.21	4.62
<i>Vándor</i>	2.08	3.81	2.95

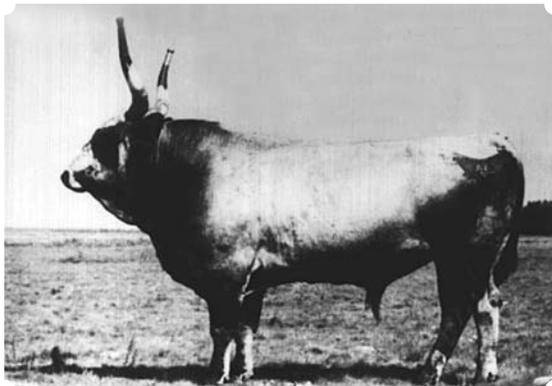
It can be seen, that *Kardos* is the only bull having a more decisive role in shaping the current gene frequencies of the stock, because he was the maternal grandfather of several bulls. Otherwise the most important influence is that of the founders of genealogical lines.

A suitable breeding goal should be in the future—beside maintaining existing genealogical lines—to form new breeding lines, based either on phenotypic traits (muscling, horn colour, horn conformation) or on molecular genetic results—if it will be possible.

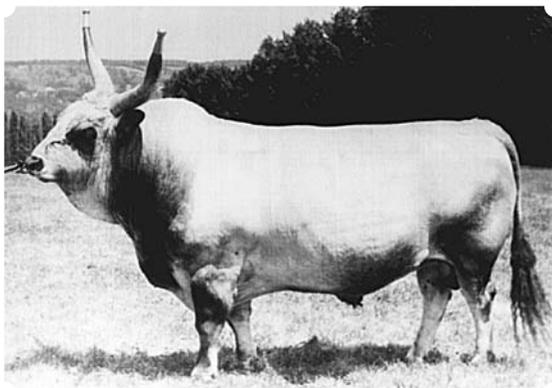
## THE LINE „M” THROUGH THREE GENERATIONS



Maros (*grand sire*)



Morgó (*sire*)



Mérges (*son*)

*These three pictures prove the possibility  
of the improvement of beef characteristics of the breed*

## UTILISATION OF THE HUNGARIAN GREY CATTLE 7.

---

Under conditions of today—taking into consideration its favourable and unfavourable traits—Hungarian Grey cattle can be calculated with the following forms of utilisation purposes and breeding methods during further life of the breed:

- Gene reserve (7.1.)
- Beef production, by pure-bred breeding (7.2.)
- Beef production, by crossbreeding (7.3.)

It is worth having a closer look at these forms of utilisation.

---

### *The Hungarian Grey cattle as a gene reserve*

7. 1.

This form of utilisation should be considered most important given the conditions of today. Although the breed has been maintained for this very purpose, yet this breeding goal is getting to the awareness of breeders only very slowly, therefore it is worth summarising a few thoughts on this concept.

Hungarian Grey cattle would constitute a true value as gene reserve if it keeps its uniqueness and useful characteristics. With regard to this the following should be kept in mind:

- No external breed can be included in the stocks. From herds regarded to be gene reserves, even those animals with some Maremman blood should be sorted out.

- Maintenance of the biological value must be striven for. Good conception rate, low death rate, good mothering ability, calving without assistance, maintaining a good shape even under adverse ambient conditions, readiness for grazing. (These traits serve “maternal beef production” as well.)

- It is important for the breed not to change in any directions. Beside maintaining the breed character decline of variance should also be prevented. It would be a mistake to homogenise this breed according to any of the breeders’ taste. Maintenance of existing types is desirable.

- It must be kept in mind that the Hungarian Grey cattle used to be an excellent draft animal once. Presently of course the idea of a systematic production of draught oxen and performance testing of their parents cannot be maintained seriously. Maintenance of biological values however serve this purpose indirectly, and also it should be kept in mind not to disregard the group of characteristics serving power production when forming the system of judging the conformation. It would be desirable to yoke the

young steers and classify them based on docility, power, and manageability. This would be necessary not only due to the past of the breed, but also because of the need for animal draught power arising in the developing world. Implementation, however, at present is not thought to be practicable.

*Economic aspects of gene reserve maintenance*

7. 1. 1.

It follows from what was said above that the stock to be maintained cannot be selected in a direction required by economic efficiency of today. Therefore a state subsidy to assist maintenance work is regarded as necessary in the future as well. Under present economic conditions, when prices and profitability is determined to an ever greater extent following the supply and demand relations of the market, the maintenance of this breed requires a contribution on behalf of the entire society, because it goes mainly about the interests of a far-off future and a cultural heritage. It is equally irrational to demand that the entire cost of gene conservation should be carried by the state (thus yield can and must be taken into consideration in a due proper manner), but it is desirable that through subsidies the area taken by Hungarian Grey cattle herds be as profitable for the owner as if utilised in the best economically possible way. It would be important for the farms and ranches to be able to account with this subsidy several years ahead. It is a different question how this amount of subsidy might be modified from time to time, based on the actual overall economic situation and prices.

Based on the case of the other domestic animal species and breeds it can also be envisaged that National Agricultural Qualification Institute (OMMI), maintaining its crucial role in supervision, charges the breed association with the responsibility of justification and distribution of the extent of subsidy provided certain basic requirements are met.

There are only a few non governmental organisations plus the FAO which are preoccupied with the maintenance of gene reserves in domesticated animal species and with the rescue of ancient rare breeds. Quite understandably most of the efforts (and some time even financial resources) are devoted to activities in the developing world. Nevertheless, recommendations compiled by FAO are regarded of general relevance in many respects.

Position taken with regard to the numbers of individuals in breeds is the following:

## The Hungarian Grey cattle breed

Special attention should be paid to the breed which counts less than 10,000 cows altogether.

Measures should be taken when the number of heads in the breed is less than 5,000 cows.

The breed is considered to be endangered when the extent of decline reaches a number of less than 1,000 cows.

A critical situation arises when individuals of female gender drop below the crucial number of 100 cows.

These numbers are usually accepted everywhere as practical basis, the sex ratio and other aspects taken also into consideration. In the case of the Hungarian Grey cattle this means that the number of the breed would be desirable around 5,000 cows and within this severe, gene reserve preservation should be carried out using some 800-1,000 cows.

---

### *Beef production in pure-bred stock*

7. 2.

Beside its many beneficial traits it cannot be excluded either that Hungarian Grey cattle, beyond the numbers subsidised, might be regarded as beef cattle. The following aspects support this statement:

- in a given case it might be profitable for the farm to keep Hungarian Grey cows beyond the numbers subsidised out of sheer management considerations (best exploitation of grasslands and labour resources),
- there are cases when other conditions for labour (like tourist industry) harmonise with the increased number of the herd.
- business opportunities might occur—even temporarily—which can best be exploited using Hungarian Grey cattle,
- in certain cases crossing of the surplus might increase profitability,
- a motivation can be aroused to make the breeding decision by the responsibility felt for the more secure maintenance of the breed and certain aesthetic aspects (mostly in the case of private owners).

These possibilities however cannot be regarded as the basis for the maintenance of the breed today.

In order to make Hungarian Grey cattle raising cost effective beyond the subsidised amount, the following two aspects might be taken into account:

Formation of a beef type meeting today's requirements from the stock exceeding the numbers necessary for maintaining the breed unchanged.

This means a beef variety of the Hungarian Grey cattle to be selected by using the appropriate selection methods, choosing plus-variant individuals.

It is a question of decision how much the variety to be established this way should differ from the ancient type which is maintained by price subsidy.

Maternal characteristics, mostly mothering ability is only allowed to be developed strictly under cheap technological conditions of herding when the wantlessness of the breed is to be preserved at least to a certain extent.

It is also imaginable to keep the original type and further utilised by minimal maternal selection. Independently of this using a smaller proportion of the stock a male line is to be formed which is competitive in fattening and slaughtering characteristics with the best beef cattle breeds. This is a pretty but clumsy and slow solution.

Improvement can be the more easily achieved the more we rely upon external genes. Provided damaging of the character and colour of the breed is to be avoided, it first of all the Italian beef cattle types which might come into the discussion (Romagnola, Marchigiana, Chianina, Piemontese).

As this activity has nothing to do with gene conservation and maintenance of the breed, another viable option is to create a hornless variety in order to make sharp distinction from the original type possible. This might have a significance from a point of view of manageability and "trademark" of the stock.

Nevertheless it must be taken into consideration, that this work, beside all its technical points of interest, use and beauty might require 15-20 years until a consolidated stock is formed.

This possibility is not to diminish the importance and amount of government subsidy being independent from it, and cannot interfere with the interests of gene reserve maintenance. It is also true however that if we want to possess a new and very precious stock within one or two decades, this work has to be started now.

As humankind is living more and more modern life the demand is higher and higher for food produced among natural conditions. Beyond a certain level of welfare the market is willing to honour this circumstance by higher prices.

In this case the most crucial factor is not the breed much rather the management conditions. The Hungarian Grey cattle is obviously very appropriate candidates for this marketing option due to the traditional keeping of the herd. Here the supplier guarantees that no artificial ingredients are used during production. The ban may include any kind of additives, pharmaceuticals, and what is more all the chemicals applied in pest control.

This kind of so called “bio-meat” (organic quality meat) has no internationally accepted regulation yet. A Dutch initiative is known in the fields of swine industry (Scharrel-swine). Swedish, French, German and Austrian experts are considering and discussing the possibilities of elaborating a system of rules for control.

It seems that the production of this special type of good will be regulated at different grades and in this respect the breeding habits of the Hungarian Grey cattle may comply with all the most stringent European requirements.

When finding export markets for the organic beef coming from Hungarian Grey cattle, the distinct character of the breed could be used as a trademark. At any rate, marketing organic quality meat has a prospect of quicker sale though the business is more exposed to uncertainties of a fluctuating market.

## COAT COLOUR OF NEW BORN CALVES



*markedly pale*



*pale*



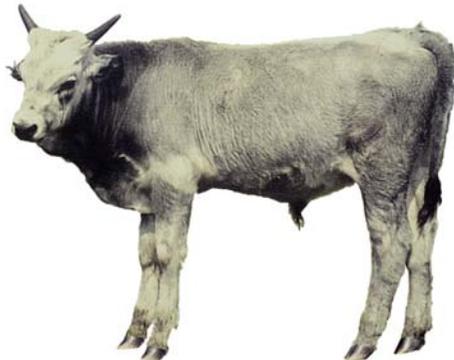
*light reddish*



*reddish*



*dark reddish*



*male calf after shedding*

*Many coat colours of new born calves indicate the genetic diversity of the breed*

This method of breeding offers an opportunity to obtain immediately more valuable and faster gaining calves from pure-bred cows. Basically their might be two different solutions:

*Simple commercial crossing*

## 7. 3. 1.

In this case both steers and heifers of the first generation are slaughtered, therefore the breed to be used has to be chosen accordingly.

The breed of the bull to be used for this purpose has to be chosen keeping in mind both the availability in the country and the proposed quality of the beef to be produced. There is not too much experience available and the expectable result might possibly be forecast based on assumptions.

*Charolais.* There is reason to believe to get great size, great terminal weight, late greasing, substantially improved beef forms from this breed. There are some experiences with this type of cross. First in 1967 were calves of this type born and since 1990 they are continuously born. These experiences show that Hungarian Grey cows had an astonishing ease at calving and 100% of the births had taken place without assistance. Weight of F<sub>1</sub> bulls at weaning corrected for 205 days' weight was 219 kg as opposed to the 204 kg respective weight of pure-bred bulls. Among the Charolais bulls there were some passing on his cream yellow colour dominantly and others not. This fact calls the attention on the necessity of proper choice in selecting bulls and bull lines because mixed and in many cases ugly smutty variants suffer disadvantage when selling animals alive.

In a Charolais crossing—and all in the others—a coarse horn represents disadvantage when judging the living stock offered for sale. Therefore dehorning and the use of genetically hornless bulls can be taken into consideration.

*Hungarian Simmental Cross* breeding based on this breed is expected to provide a fast-gaining, constitutionally well established and somewhat sooner greasing material for fattening. As opposed to homogeneously coloured beef cattle, the major adverse effect of this crossing is the heterogeneous appearance due to the mixed colour. An advantage is to get such bulls and sperm relatively easily.

*Chianina crosses* can be fattened to an even greater terminal weight as compared to Charolais crosses, greasing appears late, appearance is homogenous, but beef forms are somewhat less favourable with long legs. Italians cross Maremman systematically with this breed. A few such calves were born before in Hortobágy in 1994.

*Romagnola.* Cross-breeding with this breed promises better forms but slower gains as compared with the options described above. It is most probably the very breed which would not change the coloration of the Hungarian Grey cattle. No bulls or sperm are available today.

*Marchigiana.* A breed standing somewhere between Chianina and Romagnola and in the case of crossbreeding calves are expected to look like this as well. It would be very difficult to acquire semen or bull, similarly to the case above.

*Limousine.* This option offers the possibility to obtain uniformly red, very well formed and unusually agile beef cattle progeny. Both in gain and marketing weight to be achieved this breed is behind of those above.

*Blonde d'Aquitaine.* This is a somewhat less consolidated breed as compared to Charolais, but its growth rate and beef forms are equally good. Skeleton is thinner, and weight gain is especially high with calves. The colour of the stock arising from this crossing will not be homogenous. Such calves were born before 1993. The weight of F<sub>1</sub> bulls at weaning corrected for 205 days' weight was 210 kg as opposed to 204 kg of the Hungarian Grey cattle control bulls and 219 kg Charolais F<sub>1</sub> steers.

*Aberdeen angus.* Small in size, black or red, good forms, very early greasing progeny.

*Red Lincoln.* In terms of gain it is in line but in terms of beef forms it stays behind the Limousine. According to this, crossbreeding would result in uniformly red calves.

*Hereford.* Neither its appearance nor fattening traits give high hopes to get significant results from this breed. Under experimental conditions a few calves have been born so far.

*Shaver beef belt.* This is not a breed used for terminal crossing, either, no substantial improvement can be expected with respect to slaughtering value of the carcass.

It is worth mentioning with regard to all this what was said above, that it goes about cross breeding of different breeds which are not closely related and therefore unexpectedly good results might also come out despite all the assumptions described here. Surprises might occur in respect of both the Mendelian characters and additive traits or the hybrid vigour.

The Hungarian Grey cattle breed



*The beef production of the breed can be increased by industrial crossing*



*Also weaning weight and forms can be improved using Charolais or Blonde d'Aquitaine bulls*

This crossing has to be carried out in a way that bulls born in the first generation would constitute a precious starting material for fattening, while heifers could be utilised as beef cows and mother-cows when mated to bulls one of the terminal crossings. All individuals of the second generation are slaughtered in this scheme.

To produce the first generation Hungarian Simmental seems to be best suited. This crossing provides beneficial results both in respect of steers and heifers.

The European Brownvieh would be an elegant solution, however black colour contradicts it. Small size beef cattle breeds, which themselves are mostly excellent in mothering ability (Angus, Hereford, Red Lincoln, etc.) are not too much to reckon with, for, as it was said before, they do not improve the bulls of the first generation to such an extent that this adverse effect could be compensated for by, say, the excellent production of the cross-bred cows in contrast with Hungarian Simmental for example. Improvement of mothering ability is also to be questioned. Diminished value of the culled cows should also be taken into account.

Based on the same type of arguments it is difficult to imagine that the crossing made using Jersey-Hungarian Grey cross-bred cows, which theoretically offer the best mothering ability in all the world, would be profitable. Poor performance of the bulls in the first generation would constitute most probably a stay behind impossible to make up for subsequently.

When implementing combinative crossings frequently, the fact must be taken into account, that to carry out such schemes requires at least the same strong discipline and accuracy on behalf of the breeder as does pure-bred breeding. When the generations following each other are not used appropriately soon anarchy will arise and all the theoretically calculated and expected benefit will be lost.

Up to now Charolais x Hungarian Grey females mated to Charolais bulls have given good result in Dezső SZOMOR's herd.

Doubtlessly, preservation of gene reserves is the responsibility of the entire society, yet in order to diminish expenses the marketing possibilities should also be dealt with. In the following the different marketing possibilities of the Hungarian Grey cattle will be discussed in detail.

*Sale of surplus calves*

7. 4. 1.

Sale of weaned calves is extremely important and should be done by taking characteristics of the Hungarian Grey cattle and the demand of the market into account simultaneously. Not all of the farms are able to establish feed-lots and farms possessing extensive grasslands furnish themselves mostly to keep maternal stocks.

Suckling calves with small weight (veal calves)

7. 4. 1. 1.

In the case of the Hungarian Grey cattle this means a calve under 100-120 kg (liveweight) at an age of 1-4 months. Regarding the seasonal calving customary today these might be marketed mostly from February to August-September. The issue of abandoning seasonal calving also emerges, however. This would mean mating throughout the year with all the costs and benefits.

In this case a problem is the price of the calf as well. When calves are sold only after reaching the customary weaning weight, production might be twice as much without increasing costs substantially. Thus sale of suckling calves is cost effective only in the case of very high prices.

Sale of weaned calves for direct consumption ("baby beef")

7. 4. 1. 2.

Weaned calves (180-200 kg) represent a veal quality with extremely high consumer value. This however does not belong to current articles of the market. as slaughtering and transport costs accumulate unfavourably high. Yet in the case of Hungarian Grey cattle this form of direct marketing seems to be a relevant option to produce a greater amount of beef. The need would arise to introduce this product on the market. The duality of seasonal production and the possibility of mating and marketing throughout the year can be discussed as well.

*Intensive fattening*

7. 4. 2.

After weaning fattening is carried out through intensive feeding which require quite high amounts of grain-feed. In this system the Hungarian Grey cattle breed is not competitive in face of the best beef cattle of the world neither in terms of gain nor of the customary value of the terminal product. It is questionable whether this is true in the case of feed utilisation and whether marketing slaughtered or processed to a more advanced level judgement would not be more favourable.

*Extensive, slow fattening methods*

7. 4. 3.

This is the traditional fattening form of the breed. After weaning a relatively well established feeding system should be considered since the growth rate of the young animals should not be neglected. Having been driven to the pasture grazing of the animals is not substituted and it is possible to terminate grazing the autumn with the use of a little grain at the age of 18-20 months, or alternatively, keeping the stock for another year, wintering with quite extensive (minimal) feeding and selling after the third grazing period, at the age of 20-31 months. Certainly according to the traditions these would be bullocks and not bulls. The method can mostly be argued for by emphasising utilisation of readily available grass on the range-land. However, with regard to labour efficiency and management this method might pose some difficulties.

This kind of marketing method is strongly associated with seasonality. Depending on the extent and length of the terminating "improving" feeding it can be implemented both during autumn or early winter.

It is also possible to omit improvement with grain feed and to sell slaughtered products, which does not quite fit customary procedures and represents a complete re-evaluation of quality.

*Marketing of culled animals*

7. 4. 4.

An essential element of production is the sale of culled cows from year to year (maybe that of elderly barren heifers). In terms of quantity it is not negligible while quality mostly depends on the age of the animals. In the case of Hungarian Grey cattle it is not customary to sort out many relatively young cows using fast rotation, therefore you cannot calculate with usual average

prices of conventional sales. Special markets might take excellent quality “buyon-beef”. Using appropriate preparing methods and excellent culinary techniques it provides a kind of meat suitable to prepare delicious meals, which can also be argued for from a point of view of sound human nutrition.

The problem of seasonality is raised also here with good reason. Seasonal calving of today is namely accompanied by equally seasonal culling, because after establishment of pregnancy and weaning of calves cows are sent for slaughtered most appropriately in late autumn. At these times however, market prices are unfortunately low. From the aspect of grading the marketing of cattle sent for slaughtered alive would be most appropriate in a somewhat earlier period.

*Marketing and grading of carcasses*

7. 4. 5.

Pure-bred individuals of Hungarian Grey cattle do not usually get the best grades due to insufficient beef forms, when grading is carried out alive. This applies to all of the categories mentioned. Grading in carcass might be more favourable. It is particularly true when animals are sent to the slaughterhouse directly from the pasture. When a slight “maturing” feeding is not applied using nutrients of higher energy content, live animals do not meet the conventional expectations of beef grading. It would be interesting however, to think this problem over again from the point of view of the customers who prefer leaner beef. Grading alive will be out omitted sooner or later anyway.

*Marketing of processed meat*

7. 4. 6.

Theoretically, beside carcasses other kinds of processed beef can also be taken into account. For more favourable prices it seems to be the best solution.

There are some good initiatives in this respect. As results of the efforts of the Association, the Department of Animal Breeding at Debrecen University and the Research Institute for Meat Industry are engaged in the topic.

The Hortobágy Non Profit Trust produces organic meat for “baby conserves”. The Szeged Pick factory used the beef of Hungarian Grey cattle for salami processing. Home made sausages of Dezső SZOMOR were successful at an exhibition in Germany.

The introduction of trade mark and traceability is important for the successful marketing of these excellent products at home and abroad.

*Direct marketing to consumers*

7. 4. 7.

An extreme form of this strategy is when a producer is at the same time the owner of a restaurant and he serves the beef there. In this case, using appropriate organisation methods—the entire profit goes to the producer. It is questionable however, that using this type of direct marketing how the special values of the Hungarian Grey cattle can be expressed in premium prices, since many of the consumers are not able to make a distinction between different breeds. This is a question of advertisement, however.

*“Bio-beef”, “natural-beef”, “organic-beef”*

7. 4. 8.

In Hungary, the most frequently used term is “bio-beef”. This is a kind of meat, which has been produced throughout the entire production cycle using natural feeds, avoiding chemicals and complying with stringent animal health regulations. Thus, it is not enough to grade the terminal product only: in this case the certification of the entire production cycle should be monitored.

The concept is not bound to any breed or species. The breed of Hungarian Grey cattle might be assigned as a “trade mark”, being a guarantee for the fact that the animal was indeed kept under natural circumstances.

As a matter of fact, any of the above mentioned beef and veal categories could be sold as certified organic products.

The same consideration applies to many other native animal breeds which might be taken into marketing strategies of this kind.

For the producer of the organic quality beef the certification would be interesting for the premium price which can be got for an organic product. These products usually have a lower yield per unit input and therefore it is justified to ask for a premium price.

To marketing of Hungarian Grey cattle meet as organic product seems to be a useful idea, but to introduce a brand new product on the market requires always plenty of time and much devotion.

Registration of the Hungarian Grey cattle has to fulfil two different requirements: preservation of genetic diversity and record of single-purpose beef cattle performance. The latter seems to be necessary because during the recent years an increase in valuation of the private breeding herds and low-input-systems rendered it possible that beside gene reserve maintenance stocks for production would also be formed.

*Identification, individual marking*

8. 1.

The general assembly of the Hungarian Grey cattle breeders in 1992 did not accept the uniform, modern individual marking of animals, but prescribed the use of the traditional system for its members. Computerised systems also had to adapt to this condition, while pre-marked name tags which are mandatory when exporting animals cause no trouble since there is no intention to export this breed at any time in the future.

The new-born calves received the identification number of their mothers and the last digit of the year of birth tattooed in their left ear as an individual marking for their entire lifetime. Beside this, the number of the herd has to be applied where the calf was born. In addition to this the calves are supplied with ear tags bearing the same data.

Since the general identification system (ENAR) is obligatory in most of the herds the life member is tattooed in the ear. Some of the traditional herds uses the traditional system besides the official ear tags.

*Breeding bulls* usually wear a central list number. This number is included in the herd book as a remark. Of course, all the bulls have a name as well. The initial of the name depends on the founder of the line (see the chapter on the lines): B, C, M, V, T, L, S or K. Certainly, when a bull is intended to found a new genealogical line, this may be indicated with a different letter. The name of the bulls has to be given at the time of being put into service, so that they be possibly Hungarian names of two syllables and they must not be repeated within 4-5 generations.

Besides of ear tags in some herds individual labels burnt into the hide or horns are used. Name of the cows usually refers to the family, that is, each cow inherits her mother's name. This is considered to be compulsory in the framework of gene reserve maintenance. In the other herds, of

course, it is the right of the owner to give names. It is also possible to have cows without names, simply provided with individual numbers.

---

*Collection and processing of breeding data*

8. 2.

The same breeding data are collected in the case of Hungarian Grey cattle as in all the cattle stocks. That is

- date of mating, identification of cow and bull;
- date of birth, sex and ear number of the calf;
- verification of the parentage based upon the result of blood typing test, or duration of pregnancy.

Based on the above mentioned data the computerised data recording system makes it possible to fill out a pedigree form for all the individuals, usually containing four rows (generations) of ancestry and,—should the need arise—all the ancestors can be looked up back to 1952.

It is very important, based on the data above, to calculate the rate of inbreeding and the Wright coefficient of the breeding animals, respectively.

All these gain particular significance planning the matings, when it is usually possible using the computer program to match all the cows with the bull which gives the least inbred calves when mated. In the case of a planned inbreeding program the same computer software helps in finding the most suitable solution.

Based upon descendance and pedigree there are 4 herds book classes:

- class “A” with 4 complete removes;
- class “B” with 2 complete removes;
- class “C” doubtless pure bred;
- class “D” crossed animals.

The Hungarian Grey cattle breed



*A bull of the Városföld State Farm in winter*



*The Hungarian Grey cattle can be kept outdoor also in winter*

The herd-book registration



*The calves must be tattooed just after calving*



*Corrals and gates are indispensable also in extensive herd management*

In this chapter the collection of data, usual in beef cattle production, will be discussed.

Measuring the weight of birth is not compulsory and usually not done. In references the respective numbers are calculated with as 25 kg for heifers and 30 kg for bull calves.

Process of calving. Cows of the Hungarian Grey cattle deliver practically without assistance in 100 % of all the cases. Therefore the process of the calving, grades of difficulty are not recorded in the herd book. If however a cow needs assistance at calving, it should be noted, because this individual is not desirable in the breed, her progeny should be sorted out from the replacement stock and the cow itself culled the sooner the better.

A very important characteristic of cows not to be neglected is continuous calving.

Its index number is the regularity of the annual calving. Under herding conditions it is not always possible to regard the number of matings, services necessary to obtain one calf, therefore it is more appropriate to use the calvings as a base. As it goes about fertility here, in this case the observed abortions and still births should be counted as well.

This might seem strange, but can be supported by the fact that abortion and still birth are traits mostly with low heredity.

Certainly it needs to be judged differently if the events occur frequently from year to year.

Based on the calvings cows can be ranked in classes a possible system of which is shown below.

Table 9

*Categorisation of Hungarian Grey cows according to the number of conceptions*

age	No. of breed- ing years	Elite	Class I	Class II	Class III
		N o . o f p r e g n a n c i e s			
4 years	1	–	–	–	1
5 years	2	–	–	–	1
6 years	3	–	–	4	2
7 years	4	–	5	4	2
8 years	5	6	5	4	3
9 years	6	6	5	4	3
10 years	7	7	6	5	4
11 years	8	8	7	6	4
12 years	9	9	8	6	5
13 years	10	9	8	7	5
14 years	11	10	9	8	6
15 years	12	11	9	8	6
16 years	13	12	10	9	7
17 years	14	13	11	9	7
18 years	15	13	11	10	8
19 years	16	14	12	10	8
20 years	17	14	12	11	9
21 years	18	1	13	11	9
22 years	19	16	13	11	9
23 years	20	17	13	11	19
24 years	21	18	14	11	19
25 years	22	19	14	11	9
26 years	23	19	15	12	10
27 years	24	20	15	12	10
28 years	25	21	16	12	10
29 years	26	21	16	13	11
30 years	27	22	16	13	11

This system is built on mating at the age of three according to the “classical” ranching method, cows having calved earlier might enjoy some advantage but this can be lost later.

The judging of elderly cows is somewhat less rigorous.

A disadvantage of the method is that proper distinction with regard to conception can only be made at a more advanced age: the system differ-

entiated only after eight years among the four different categories (Elite, Class I, II, and III).

Considering the fact that the breed can rather be utilised as a maternal line with regard to beef production traits, weaning weight and time is considered to be very important and therefore mandatory. This parameter—though its heritability is very low,—is the sole entry of the cow on her performance and also the first parameter of the calves with regard to production.

Based on this annual 205 day's weights are calculated, which are suitable for comparison and the stocks of different years can be compared on the basis of this.

The Table 10 shows standard weights. Data indicated here refer to keeping without concentrate feed.

Beside this the herd book contains collected data of annual weighings (date, weight) as well. Of these, adult weight has more significance from the point of view of gene reserve preservation, that is the weight of bulls and cows between the age of 6 and 8 years.

Weight measured at the time of putting into reproduction service can be evaluated as a data referring to the intensity of rearing and development. These are also recorded in the file since on these occasions most of the animals are weighed.

Development of young animals can best be judged when weighing on the autumn (September) pasture.

Table 10  
*Standard weaning weights of Hungarian Grey calves*

age days	weight		age days	weight	
	males/kg	females/kg		males/kg	females/kg
150	159	144	230	218	195
160	169	152	240	224	200
170	177	160	250	230	205
180	185	168	260	236	210
190	193	174	270	242	215
200	200	180	280	248	220
210	206	185	290	254	225
220	212	190	300	260	230

(BODÓ 1968)

Data of judging conformation are certainly also recorded in the herd book, but the appearance of more valuable individuals, cows of breeding stocks and breeding bulls is stored in the form of digitised pictures in the herd book. The pictures, beside being made to scale, are supplemented with a short description. Measurement by digitised pictures of videotechnics (VATEM) is used in Hungarian Grey cattle herds.

In the Hungarian Grey cattle breed there are only conformation (I., I/II., II., II/III., III., IV.) pedigree (“A”, “B”, “C”, “D”) and reproduction (E, I., II., III.) classes. The bull-mother cow does not exist, either as a strict category, it is the breeder who decides from time to time whether the calf of a particular cow should be kept and used for reproduction purposes.

It is important however, both from the point of view of maintaining genetic diversity and to constantly improve biological value and beef production capacity of the breed to record the special characteristics of particular individuals using the herd book. These features are contained in the form of comments in the herd book in details, and beside this particularly important characteristics are highlighted in the ordinary herd book records as well. These are for example:

- Special horn conformations (“kukora” horn, goat horn, shako horn, etc.);
- Special colour (dark iron grey, “ókula” eye spot on cows);
- Horn colour (green horn, “kártyás” horn);
- Extreme body size (very big, very small);
- Type (small holder’s, dairy, draft);
- Great 205 day’s weight;
- Excellent fertility (and longevity);
- Rare immuno-genetic factors;
- Pigment (palatum, muzzle, etc.)

Certainly these are not considerations for selection purposes, much rather they need to be recorded in order to prevent them from vanishing through genetic drift and to maintain their original frequency.

Characteristics important from the point of view of meat production are not classified either, but the demonstration of deviations from the average (mean) makes it possible for the breeders to rank their animals.

This chapter is only a brief summary of the most important technological aspects, but questions such as breeding, genetics and marketing will not be dealt with as they were already discussed in detail in the preceding chapters.

In general the rotation of the cattle stock may be slow, utilising the longevity and extending the generation interval of the breed.

Feeding is mainly based on the pasture. In summer, the cows graze only, the bulls, occasionally may get some feed concentrates as well. The suckling calves can get concentrates depending on the marketing outlooks. Weaned calves are fed more intensively during the winter after weaning, thus heifers and young bulls can be set to breeding at 2-3 years of age.

The winter feeding is based upon hay grown on the grasslands and on side products, mainly corn-stalks.

The rations must be calculated according to the prescriptions used with beef cattle. A certain loss of body condition is acceptable in the case of the cow stock by the end of wintering.

The cows need no grooming or any special care, however, bulls must be equipped with horn-knobs.

During winter, the herd may be accommodated in cheep buildings, herd-shades, as well as in an open air corral. It is important that the feed transportation should not cause damages in the corrals, therefore transportation can be best done with ox-carts, or with self-feeders. The practical placement of stacks and feed stores also help reducing the expenses of wintering.

The number of days of wintering depends on the weather conditions, it is desirable, however, that this period should not be longer than 145 days. Wherever it is possible, the cows should go out even in winter.

The most appropriate time of weaning is between 20st of October and 1st of November. The weaning weight at 200 days of age is as much as 180 and 200 kg in the case of heifer and bull calves respectively. The best of the stock, however, in the case of favourable weather conditions, can reach even higher body weights at weaning.

The normal mating period lasts from 1st of April to 31st of July. Occasionally, however, due to the actual marketing conditions and other circumstances a deviation from this is also possible. In general it seems to be justified in this breed to do the matings periodically.

The breed is regarded as resistant to diseases, veterinary interventions are needed. The use of different preventive and yield-increasing substances are prohibited by the regulations of organic production even otherwise.

Two herdsmen, on the average, can take care of 200-250 cows and their progeny, this number of individuals can be remembered and known individually. Therefore this number of man power can meet the requirements of a high standard cattle production including the keeping of records about important events.

It has proven to be a correct practice, if the herdsmen had the right to keep free of charge one of their privately owned cows among the animals of the herd. This special sort of salary supplement is a good encouraging to devoted work.

Although, in many cases the purpose of breeding Hungarian Grey cattle is not a profit making activity, it is necessary—in the frames of an exact accountancy—to make a yearly preliminary calculation and a recalculation of the expenses and incomes. In addition to this it is also advisable to make records of the main events of the year, such as changes in the staff number and other circumstances which may influence the total income.

Data of the obligatory breeding registration contain all the important events of the herd during the year. A copy of it serves for introducing of date into the herd book of the Association.

**ASSOCIATION OF  
HUNGARIAN GREY CATTLE BREEDERS**

**10.**

*Magyar Szürke Szarvasmarhát Tenyésztők Egyesülete*

In the sixties Hungarian Grey cattle were to be found almost nowhere except in state farms, these where a modest stock got to each of the following farms: Orosháza "Új Élet" Cooperative Farm and Kiskunfélegyháza "Lenin" Cooperative Farm. Breeders knew each other perfectly well. No year passed without Mihály MOLNÁR (Városföld State Farm), János DEME (Kiskunfélegyháza "Lenin" C. F.), János MAJA (Orosháza "Új Élet" C. F.), Péter IMRE, János MOLNÁR, István BODÓ (Középtisza State Farm) and Imre BODÓ, János DOMSITZ, Attila BUJDOSÓ, János KATONA (Hortobágy State Farm) visiting each other.

Acquisition of breeding bulls from one of the farms was always possible. A continuous discussion was carried on the future of the breed and problems in breeding and husbandry. An organic development of this practice was the initiative to organise the meeting of Hungarian Grey cattle breeders, each year on a different farm.

The first such meeting was held in 1982. Since then the meeting never failed to come about. At these gatherings those taking a role in the maintenance of the breed received invitations (county and national inspectorates).

These meetings have always focused on some important issue beside talking on the current questions. The following summary shows the place and topic of the meetings:

1982	Hortobágy	Values of the Hungarian Grey cattle and the current situation
1983	Kunhegyes	Breeding and genetic problems
1984	Városföld Bugac	Conformations and judging of the breed
1985	Orosháza–Tatársánc	Performance testing
1986	Kiskunfélegyháza–Bugac	The system of collecting data
1987	Hortobágy	Management and technology
1988	Bánhalma	The formation of lines and their role in breeding
1989	Szalkszentmárton– Nagyállás	Benefit from the Hungarian Grey cattle breeding
1990	Balatszentgyörgy	The possibilities of organic production
1991	Orosháza–Tatársánc	Formal establishment of the association
1992	Bocfölde	Economic possibilities, marketing, sales
1993	Hortobágy	The herd book registry; grant proposals
1994	Dömsöd–Apajpuszta	The impact of the Act on Animal Husbandry on the activity of the association

In the program of the meetings the gathering of herdsmen was an integral part since without their devoted work this breed would not have been able to survive.

By the year 1989 legislation in Hungary rendered it possible to create breeders' associations. The association was decided and established during the first General Assembly held at Tatársánc beside Orosháza.

As the first President of the Association

Imre BODÓ,

as the first secretary

Gábor KOPPÁNY was elected by the General Assembly, and

István GERA as manager.

Provided that the "informal" gatherings (where all the breeders participated in full numbers) can be regarded as a continuity of right, the Association of Hungarian Grey Cattle Breeders is the oldest among the associations operating today.

In 2004 already 200 breeders and herds are belonging to the Association, some of them having one cow and others more than 800.

Letterhead of the paper for official use bears the image of fighting Hungarian Grey bulls, while the stamp is decorated with the head of the cow *5 Csengő* of the Városföld–Bugac herd. This cow was in service up to the age of 32 years and she had 27 calves (both drawings are the works of István GERA), thus she represents the breed deservedly.

Annual General Assemblies are continuously held in one of the breeding farms, usually at the beginning of summer. Beside all these regular expert meetings, discussions, debates, even extraordinary General Assemblies take place in the autumn period, when two and a half-year-old breeding bulls are displayed, distributed and sold, respectively on the Kecskés site of the Hortobágy Non Profit Company (formerly State Farm).



*The enthusiastic work of cowboys is indispensable in gene preservation*



*The Hungarian Grey cattle belongs closely to the image of the "Hortobágy Puszta"*

After the dimmed distant past of the beginning and the period of the Golden Age the Hungarian Grey cattle has survived a great decline in numbers and got into the ranks of rare breeds threatened by extinction. Today, it is considered to be a valuable gene reserve.

This means that its maintenance is important for the animal husbandry of both our home country and the world, regardless of how this breed is judged based on the marketing possibilities of today. International regulations for the maintenance of genetic resources are being formed more and more accurately and there is reason to hope that, come what may, the Hungarian Grey cattle as a national treasure will not be let lost in the future either.

The word gene reserves however has an important element in the expression "reserve". Reserves can be drawn forth at any time when the need arises. There are tendencies in the world directing towards the possibility to an eventual increase in the economic significance of the Hungarian Grey cattle.

Instead of the high yielding production more and more the production with great economic efficiency comes in the foreground. In this field how-



ever, a breed well adapted to local conditions has some advantage. Wantlessness can easily be coupled with an increase in production standards using commercial crossbreeding. There are promising results in this field as well.

The fact, that this breed is grazing in a National Park, offers a good opportunity for assistance to maintain the breed by contributions from the income through the tourist industry.

However the maintenance of territories in their natural condition by pasturing is more important. The coexistence of cattle herd and birds and insects is an essential and indispensable factor in the life of Natural Parks.

The chemical and fertiliser free territory of the National Parks offers a possibility for organic animal husbandry as well. The production of a uniquely precious and excellent quality beef would be viable, provided that producer and market could find each other.

The processing and marketing of special products ("hungaricum") afford an economic solution.

It is up to the skilfulness, diligence and aptness of the breeders of the Hungarian Grey cattle, which of the many emerging options might be realised in the future in our ever changing world.

*The following list of references does not intend to be complete, it merely contains those books and articles from periodicals, which are significant or reference has been made in the text to them.*

- Adametz, L. (1892): *Die Rinderrassen und Schläge in Bosnien, der Herzegovina und nördlichen Theile des Sandtschake von Novibazar*. Wien, 36 pp.
- Alderson, G. L. H. (1989): *The chance to survive*. Northamptonshire, A. H. Jolly Ltd. Yelvertoft Manor, 143 pp.
- count Almássy, K., Sr. (1896): *Sarkadi törzsgulyájának ismertetése Sarkad*. Printed in Gyula, 13 pp.
- Balogh, S. (1909) Magyar és nyugati fajtájú szarvasmarhatenyésztésünk. *Köztelek*, Vol. 19, No. 47., p. 1417.
- Balogh, S. (1910): *A szarvasmarha tenyésztése és tartása*. Budapest, Pallas Rt., 20 pp.
- Battha, P. (1935): *A magyar fajta szarvasmarha tenyésztésének felkarolása*. Budapest, Pátria, Rádió előadássorozat, p. 133-140.
- Battha, P. (1934): Olaszország podóliai marhái. *Köztelek*, Vol. 44, No. 41-42., p. 405.
- Benke, Gy. (1932): A magyar marha szerepe a Tiszántúl köztenyésztésében. *Köztelek*, No. 10., p. 110.
- Benke, Gy. (1935): A magyar ökor létérti küzdelme a gazdasági válságban. Miskolc, Különlenyomat, *Tiszajobbparti Mezőgazda*, June 17, 1935, 21 pp.
- Béri, B. (2002): Génmegőrzés és gazdaságosság a magyar szürke szarvasmarha tenyésztésben. In: *Génmegőrzés kutatási eredmények régi háziállatfajták értékeiről*. Debreceni Egyetem, Debrecen p. 39-48.
- Bíró, I. (1984): How to avoid genetic loss of domestic animals. Hungarian approach. In: Bodó, Buvanendran, Hodges: *Manual*, Vol. II, p. 25-36.
- Bodó, I. (1968): *A magyar szürke marha küllemének és teljesítményének megítélése*. Doktori disszertáció (kézirat) Gödöllő, Agrártudományi Egyetem, 110 pp.
- Bodó, I. (1973): *Zucht und Haltung der uralten ungarischen Haustierrassen auf der Steppe von Hortobágy. Domestikationsforschung und Geschichte der Haustiere* 1971. Symp. Budapest, Akadémiai, p. 355-363.
- Bodó, I. (1976): *Hortobágy állattenyésztése. Hortobágy. (A nomád pusztától a Nemzeti Parkig)*. Monográfia. Ed.: Mrs. G. Kovács, F. Salamon. Budapest, Natura, p. 115-156.
- Bodó, I. (1982): *The Hungarian Grey Cattle. Aspects and results in Gene Conservation*. Debrecen, Int. Conf. on Gene Reserves, their Significance in Preserving animal. Species and Breeds, p. 1-5.
- Bodó, I. (1982): *Ein Nationalpark für urige Rinder*. Bern and Stuttgart, Grzimeks Tier-Sielmans Tierwelt 4, p. 40-45.
- Bodó, I. (1982): *A magyar szürke fajta jelen helyzete és értéke*. Magyar szürke tenyésztők Országos Tanácskozása (kézirat) Hortobágy, 11 pp.
- Bodó, I. (1983): *A magyar szürke szarvasmarhafajta*. Monográfia. kézirat. Társsz.: Matolcsi, J., Mrs. Gecse, L., Németh, M. 101 pp.
- Bodó, I. (1983): *Tenyésztési és genetikai kérdések a magyar szürke fajta fenntartásában* (kézirat) Kunhegyes, Magyar szürke tenyésztők Országos Tanácskozása, 19 pp.

## The Hungarian Grey cattle breed

- Bodó, I. (1984): *A magyar szürke marba küllemének leírása.* (kézirat) Bugacpuszta, Magyar szürke tenyésztők Országos Tanácskozása, 14 pp.
- Bodó, I. (1985): *Hungarian activities on the conservation of domestic animal genetic resources.* FAO AGRI. 4., p. 16-22.
- Bodó, I. (1985): *Qualities of the small populations of Hungarian Grey cattle in beef production based upon cross breeding.* Halkidiki, 36th Ann. Meet. EAAP. Társsz.: Réti, J. C3. 6., 8 pp.
- Bodó, I. (1985): *A magyar szürke marba teljesítményének ellenőrzése.* (kézirat) Orosháza– Tatársánc, Magyar szürke tenyésztők Országos Tanácskozása, 11 pp.
- Bodó, I., Dohy, J., Hajas, P., Keleméri, G. (1985): *Húsmarbatenyésztés.* Budapest, Mezőgazdasági, 349 pp.
- Bodó, I. (1986): *Adatok a szürkemarba fej és szarvalakulásiának megtételeéhez. Őshonos és honosult bázisállatfajtáink genetikai sajátosságai.* Kutatási jelentés. Társsz.: Reményi, K. A., Kaposvár, p. 30-46.
- Bodó, I. (1986): *A magyar szürke marba fiziológiai és immunogenetikai paramétereinek vizsgálata. Őshonos és honosult bázisállatfajtáink genetikai sajátosságai.* Kutatási jelentés. Társsz.: Takács, E., Csontos, G., Dohy, J., Gippert, E., Kovács, Gy., Stukovszky, I. Kaposvár, p. 15-29.
- Bodó, I. (1986): *Az adatok gyűjtésének és feldolgozásának rendszere a magyar szürke szarvasmarbát tenyésztő gazdaságok számára.* (kézirat) Kiskunfélegyháza. Magyar szürke tenyésztők Országos Tanácskozása, 10 pp.
- Bodó, I. (1986): *The Hungarian Grey Cattle, Podolian Breed.* In: *I Convegno su l'allevamento del bovino Podolico nel Mezzogiorno d'Italia.* Acerno, p. 287-296.
- Bodó, I. (1987): *Principles in use of live animals. Animal genetic resources strategies for improved use and conservation.* An. Prod. Health Paper. 66. FAO Roma, p. 191-197.
- Bodó, I. (1987): *A magyar szürke marba tartásának standardje.* (kézirat) Hortobágy. Magyar szürke tenyésztők Országos Tanácskozása, 12 pp.
- Bodó, I. (1987): *Magyar szürke szarvasmarha. The Hungarian Grey Cattle. Das ungarische graue Steppenrind.* Debrecen, Hortobágyi Nemzeti Park, 15 pp.
- Bodó, I. (1987): *The Hungarian Grey Cattle in modern beef production.* World Rew. Anim. Prod. 23 (2) p. 69-72.
- Bodó, I. (1987): *Alte Haustierrassen in Ungarn.* Arche Nova 5. 1., p. 31-36.
- Bodó, I. (1988): *A génerózió elleni komplex védekezés biotechnikai és tenyésztéstechnikai módszerekkel. Az állattenyésztés legújabb kutatási eredményei.* Társsz.: Dohy, J., Takács, E., Terdik, J., Bárdos, J. Gödöllő, Orsz. Tud. Tan., 181 pp.
- Bodó, I. (1988): *A magyar szürke vonalak kialakulása és szerepük a tenyésztésben.* Magyar szürke tenyésztők Országos Tanácskozása, Bánhalma. 15 pp.
- Bodó, I. (1989): *Organised gene preservation in Hungary.* Bugacpuszta, Proc. Ist. Gene Conservation Workshop of DAGENE, p. 12-15.
- Bodó, I. (1989): *Methods and experiences with in situ preservation of farm animals.* Roma, An. Prod. Health Paper, 80., p. 85-102.
- Bodó, I. (1989): *Die Anwendung einiger speziellen Methoden der Genkonservierung in Ungarn.* Wiener Tierärztliche Monatschrift, 76., p. 285-289.
- Bodó, I. (1989): *A magyar szürke marba hasznosítása.* (kézirat) Szalkszentmárton, Magyar szürke tenyésztők Országos Tanácskozása, 19 pp.
- Bodó, I. (1990): *The maintenance of Hungarian breeds of farm animals threatened by extinction.* In: *Genetic Conservation of Domestic Livestock.* Ed.: Alderson, L. C.A.B. International (RBTS), p. 73-84.

## Bibliography

- Bodó, I. (1990): *A magyar szürke marha hasznosításának lebetőseje 1990-ben, különös tekintettel a vegyeser mentes termelésre.* (kézirat) Balatonszentgyörgy, Magyar szürke tenyésztők Országos Tanácskozása, 9 pp.
- Bodó, I. (1990): *Colour Variation in Hungarian Grey Cattle.* Krems, I. Int. DAGENE Symp. on Gene Cons, Abstr.: 16 pp.
- Bodó, I., Gera, I., Koppány, G. (1994, 2002): *A magyar szürke szarvasmarha.* Magyar Szürke Szarvasmarha Tenyésztők Egyesülete, 120 pp.
- Bodó, I., Gera, I., Koppány, G. (1996): *The Hungarian Grey Cattle breed.* Magyar Szürke Szarvasmarha Tenyésztők Egyesülete, 128 pp.
- Boehncke, E (1990): *Prädikat wertvoll: Alle Robustrassen im Biolandbau.* Unser Land, Arche Nova, Nr. 9., p. 22-23.
- Bocsor, G.(1960): *A magyar tarka marha.* Budapest, Akadémiai, 371 pp.
- Bonadonna, T. (1959): *Le razze bovine (bufalí, cattali, sebu).* Milano, Progresso Zootechnico, 1037 pp.
- Borgioli, E., Giuliani, R. (1951): *Gli indirizzi zootecnici e la riforma fondiaria.* In: *Quaderni della Maremma.*
- Bökönyi, S.(1961): *Die Haustiere in Ungarn in Mittelalter, auf Grund der Knochenfunde. Viehzucht und Hirtelenleben in Ostmitteleuropa.* Budapest, Akadémiai, p. 83-111.
- Bökönyi, S. (1974): *History of domestic mammals in Central and Eastern Europe.* Bp., Akadémiai.
- Bölcskey, K., Bárány, I., Berta, E., Bíró, G., Bodó, I., Bozó, S., Györkös, I., Lugasi, A., Stüh, M., Székely-Körmöczy, P., Szita, G., Sárdi, J. (2001): Magyar szürke tehének haszonállat-előállító keresztezése charolais és fehér-kék belga fajtával. *Állattenyésztés és takarmányozás.* 50./1. p. 43-57.
- Brem, G., Graf F., Kräusslich H. (1982): *Genetic and economic differences between alternative methods of gene conservation.* EAAP, Leningrad, 33th Meet.
- Brem, G., Brening, B., Müller, M., Springmann, K. (1989): *Ex situ cryoconservation of genomes and genes of endangered cattle.* Roma, Animal Prod. Health Paper 76, 123 pp.
- Brummel (1900): *A honfoglaló magyarok állattenyésztése.* *Erdélyi gazda,* p. 1-42.
- Contescu, D. (1958): *Szarvasmarhatenyésztés. (Cattle breeding).* Bukarest, Mezőgazdasági és Erdészeti, 321 pp.
- Cunningham, E. P. (1983): *European Friesians—the American and Canadian invasion.* AGRI. 1. p. 21-230.
- Cselkó, I. (1908): *Szarvasmarhatenyésztés. (Cattle breeding).* Budapest, Pátria, 328 pp.
- Csukás, Z. (1954): *A honosulás és rögszilárdság.* *Magyar állatorvosok lapja,* No. 12. Budapest.
- Csukás, Z. (1943): *A podoliai marhacsoport az Appenini félszigeten.* Debrecen–Pallag, 39 pp.
- Czilhert, R. (1859): *Állattenyésztési eszmék szemközt a Magyarországon jelenleg alaphól megváltozott gazdálkodási viszonyokkal.* Pest, Herz János, 148 pp.
- Devillard, J. M. (1984): *How to avoid total genetic loss of domestic animals.* The French approach. Manual for training courses ed. Bodó et al. Vol. 2, p. 64-68.
- Dmitriev, N. G., Enst L. K. (1989): *Animal genetic resources of the USSR.* FAO Animal Production and Health Paper 65., 517 pp.
- Dobrohotov, A. F. (1949): *Часовноје зоivotnovodstvo.* Leningrad, 867 pp. Uő: *Részletes állattenyésztés.* Budapest, Mezőgazdasági, 1959.
- Dohy, J., Bodó, I., Mátay, O. (1982): *Efforts for maintaining rare non commercial native breeds in Hungary.* Leningrad, EAAP, G. 1. 6. 8. p.
- Dovč, P. (2000): *Preservation of genetic resources, a molecular approach.* In: *A magyar szürke marha eredete,* p. 91-94.

## The Hungarian Grey cattle breed

- Éber, E. (1961): *A magyar állattenyésztés fejlődése*. Budapest, Közgazdasági és Jogi, 519 pp.
- Ébner, J. (1935): A maremman keresztezésekről. (On Maremman-crossings). *Magyar Állattenyésztők Lapja*, No. 10.
- Egán, E. (1887): *A tejgazdaság fontossága Erdély marbatenyésztési viszonyainak fejlesztésére*. Kolozsvár, 39 pp.
- Egán, E. (1890): *Az erdélyi szarvasmarbatenyésztés feladatai*. Kolozsvár, 27 pp.
- Engelbrecht, K. (1874): *A szarvasmarha. (Cattle Breeds)*. Budapest, Légrády Brothers, 371 pp.
- Erdélyi, M. von (1827): *Beschreibung der einzelnen Gestüte des Österreichischen Kaiserstaates, nebst Bemerkungen über Hornviehzucht, Schafzucht und Ökonomie*. Wien, Karl Gerold, 250 pp.
- Felius, M. (1985): *Cattle Breeds of the world*. Rahway, Philadelphia Division of Merck and Co. Inc. USA, 234 pp.
- Felszeghy, G. (1914): Hozzászólás állattenyésztési politikánkhoz. *Köztelek*, Vol. 24, No. 40., p. 1397.
- Ferencz, G. (1976): Óshonos, ősi magyar vagy ősi jellegű állatunk-e a magyar szürke marha? *Állattenyésztés*, Vol. 25, No. 4., p. 363-378.
- Festetich, A. (1966): Természetvédelem és a magyar puszták. *Búvár*, Vol. 11, No. 4., p. 214.
- Fonyó, I. (1943): Igásökrök takarmányozása. *Köztelek*, Vol. 53, No. 7., p. 143.
- Francé, R. (1943): *Az állatok a történelemben*. Budapest, Dante, 310 pp.
- Furchner, W., Skolaude, A. (1960): *Die Abstammung des Rindes, seine Rassen, und seine Leistungen*. Magdeburg, 22 pp.
- Geist, G. (1925): Jegyzetek. *Köztelek*, No. 54., p. 542.
- Giuliani, R. (1928): La razza bovina Maremman ed il suo avvenire. In: *Rivista di Zootechnica*.
- Glazko, V. I. (2000): Podolic cattle in the Ukraine and eastern territories. In: *A magyar szürke marha eredete*, p. 29-55.
- Gothard, S. (1884): *Néhány szó szarvasmarbatenyésztésünk érdekében*. Szombathely, Mrs. H. Schiler, 35 pp.
- Grasselli, M. (1891): *Pár szó szarvasmarbatenyésztésünk érdekében*. Rimaszombat, Ráboly, 16 pp.
- Grünenfelder, H.-P. (1994): Protection of genetic resources in Eastern Europe. *American Livestock Breeds Conservancy News*, Vol. 11, p. 16-17.
- Hammond, I., Johansson, I., Haring, F. (1959): *Handbuch der Tierzüchtung*. Berlin–Hamburg, Paul Parey, Band 1, 595 pp. Ua.: Band 3, Hamburg, 1961, 496 pp.
- Hankó, B. (1940): *Ősi magyar bázisállataink*. Debrecen, Tiszántúli Mezőgazd. Kamara, 161 pp.
- Hankó, B. (1943): Magyar háziállataink. *Mezőgazdasági Szemle*, Budapest, 78 pp.
- Hankó, B. (1952): Magyar házi szarvasmarháink eredete. *Annales Biologicae Universitatum Hungariae*. Budapest, p. 215-226.
- Hansen, J. (1927): *Lehrbuch der Rinderzucht*. Berlin, Parey, 737 pp.
- Heck, L. (1934): *Über die Neuzüchtung des Ur oder Auerochs*. Berichte. Int. Ges. zur Erhaltung des Wisents. Band 3, p. 225-294.
- Hegedűs, G. (1891): *A gulyabéli szarvasmarbatenyésztés előnyei és bátrányai*. Keszthely, Farkas, J., 42 pp.
- Hekler, A. (1885): *Mélt. gróf Coekonicus Endre zombolyai uradalma magyar fajta gulyájának leírása*. Nagyikinda, Hungaria Rt., 1885, 16 pp.
- Henson, E. (1990): The organization of live animal preservation programmes. In: *An. Gen. Res. A global programme for sustainable development*. FAO Animal Prod. Health Papers, Nr. 80, p. 103-117.
- Hill, W. G. (1972): Effective size of population with overlapping generations. *Theor. Pop. Biol.* 3, p. 278-289.

## Bibliography

- Hintz, J. (1881): *Viehzucht und Handel in Südöstlichen Siebenbürgen*. Hermannstadt, Drottleff, 31 pp.
- Hodges, J. (1990): *The global organization of animal genetic resources*. Edinburgh, Proc. 4th World Cong. Gen. Appl. Liv. Prod., Vol. XIV, p. 466-472.
- Holló, G. (2004): Hagyományos állatfajták húsának zsírsavösszetétele és humán-életteni értékelése. In: *Élelmiszer, táplálkozás és marketing*. I. évf. 1-2. sz., p. 63-72.
- Holló, G., Nürnberg, K., Seregi, J., Holló, I., Repa, I., Ender, K. (2004): Der Einfluss der Fütterung auf die Mast- und Schlachtleistung bei Jungbullen der Rassen Ungarisches Grauvieh und Holstein Friesian. In: *Arch. Tierz. Dummerstorf* 4., p. 313-323.
- Hómann-Szegfű: (1928–1934) *Magyar történet*. Budapest, Egyetemi ny., Vol. 3-4, p. 427., 483.
- Horn, A. (1940): Olaszországi szarvasmarhatenyésztési tapasztalatok. *Köztelek*, Vol. 50, No. 25., p. 514.
- Horn, A. (1955): *Általános állattenyésztés*. Budapest, Mezőgazdasági, 663 pp.
- Horn, A. (1963): *Állattenyésztési enciklopédia. II. köt. Szarvasmarhatenyésztés*. Budapest, Mezőgazdasági, 467 pp.
- Horn, A. (1966): Az állattenyésztés iránya és jövő feladatai. *Magyar Mezőgazdaság*, Vol. 21, No. 41., p. 22.
- Horn, A. (1984): The importance of conservation of genetic resources with special respect to the strategy of heterosis breeding. In: *Manual for training courses*. Ed.: Bodó et al. Vol. II, p. 95-99.
- Horváth, J. (1955): Az alföldi magyar szürke marha tenyésztésének jelentősége. *Magyar Állatorvosok lapja*, Vol. 10, No. 4., p. 133-138.
- Horváth, J. (1959): *A magyar szürkemarha védelmében*. Különlenyomat a *Jászok* Vol. 1958, Szolnok, 8 pp.
- Hönsch, P. (1967): *A maremann szarvasmarha Olaszországban*. (kézirat) Gödöllő, Agrár Tudományi Egyetem, Állattenyésztési Tanszék.
- Jakab, L. (1905): *Az erdélyi állattenyésztés fejlődése*. Kolozsvár, János Gamán, 185 pp.
- Jankovich, T. (1967): Adatok a magyar szarvasmarha eredetének és hasznosításának kérdéséhez. *Agrártörténeti Szemle* 2-3, p. 420-431.
- Jilling, T. (1987): *A TBC mentesítés hatása a Hortobágyi Állami Gazdaság magyar szürke állományának genetikai felépítésére* (kézirat) Diplomamunka. Debreceni Agrár Tudományi Egyetem, 33 pp.
- Juhos, L.: Erdély szarvasmarhatenyésztése. *Köztelek*, Vol. 24, No. 46, pp. 1628., Vol. 48, p. 1693., Vol. 50, p. 1764.
- Kerékygártó, G. (1941): A podóliai szürkemarha alföldi magyar fajtájának testarányai. *Mezőgazdasági Kutatások*, Vol. XIV, p. 317-340.
- Kodolányi, A. (1870): *A testalak és haszonvételi képesség közötti viszonyosság a szarvasmarhánál*. Kolozsvár, Rk. Lyceum, 46 pp.
- Kovács, Gy. (1972): *Data on blood-group properties of the Hungarian Grey (Steppe) cattle*. Budapest, Proc. 12th Eu. Conf. An. Blood Groups Biochem. Polymorph, p. 137-140.
- Kovács, Gy. (1989): *Immunogenetic methods in the maintenance of genetic polymorphisms in small populations*. Bugacpuszta, Proc. 1st. Gene Conservation Workshop of DAGENE p. 11-17.
- Kovácsy, B. (1901): *A gyorsan fejlődő magyar-erdélyi szarvasmarha (különlenyomat) Köztelek*, Vol. 25, Budapest, Pátria, 1901, 7 pp.
- Krüger, L. (1958): *Die zuchtwnbl nach dem Phanotyp*. (Különlenyomat) Stuttgart, Tierzüchtungslehre szerk. Zorn., p. 220-258.
- Kubinyi, F. (1859): *Akadémiai székfoglaló*.
- Lengerken, H. (1955): *Ur, Hausrind und Mensch*. Berlin, Akademie, 191 pp.

## The Hungarian Grey cattle breed

- Lengerken, H. (1953): *Der Ur*. Leipzig, Akademie, 79 pp.
- Liebenberg, O. (1963): *Beurteilung der Rinder*. Leipzig, Neumann, 160 pp.
- Liszkun, E. F. (1952): *Állattenyésztési kézikönyv*. Budapest, 144 pp.
- Liszkun, E. F. (1952): *Krupnij rogatij szkot*. Moszkva, Szelhozgij, 375 pp.
- Magyari, A. (1941): A podóliai szürkemarha alföldi magyar fajtájának testnagysága. *Mezőgazdasági Kutatások*, Vol. XIV, No. p. 233-258.
- Magyari, A. (1958): *A magyar szürke és tarka szarvasmarbafajták javítása kosztromai bikákka*. (kézirat) Moszkva, A Szovjet Tudományos Akadémia Genetikai Intézetéhez beadott dolgozat autoreferátuma. (kézirat) Gödöllő, Agrártudományi Egyetem Könyvtára.
- Majjala, K., Simon, D. L., Steane, D. E., (1985): *Report by the working party on animal genetic resources* EAAP Halkidiki, 36th Meeting Kallithea, G 6. 2.
- Maróthi-A., Á., Ratkoczi, O., Jávorka, L., Szabára, L., Bodó, I. (2001): *Analysis of characteristic features of Hungarian Grey cattle, an indigenous breed*. EAAP. G. 66. 19., p. 79.
- Mason, J. (1974): *Conservation of animal genetic resources*. Madrid, Proceedings of the 1st International Congress on Genetic Applied to Livestock Production, p. 13-21.
- Mason, I. L. (1982): *The role of the protected areas in the in situ conservation of animal genetic resources*. Debrecen, International Conference of Gene Reserves, p. 13-15.
- Matolcsi, J. (1980): *A magyar szürke fajta kialakulása*. (kézirat) Budapest, Magyar Mezőgazdasági Múzeum, 68 pp.
- Matolcsi, J. (1982): *Állattartás őseink korában*. Budapest, Gondolat, 332 pp.
- Mattes, J. (1927): *A mezőbényei magyar fajta marba monográfiája*. Kivonat állatorvos doktori értekezéséből, Sopron, 31 pp.
- Meissner, K. (1926): A magyar marha tenyésztésének felkarolása. *Magyar Állattenyésztők lapja*, No. 11., p. 168.
- Monostory, K. (1906): *A szarvasmarba tenyésztés alapvonalai*. Budapest, Franklin, 118 pp.
- Monserrat, L. (2000): Long horn cattle in the Iberian Peninsula. In: *A magyar szürke marba eredete*, p. 63-70.
- Nagy, B., Bodó, I., Gera, I., Lengyel, Z., Török, M., Szabó, F. (2004): Magyar szürke szarvasmarha állományok választási eredményei. *Állattenyésztés és takarmányozás*. 53./6. p. 503-513.
- Nagy, K. (1966): Az állatállomány és állati termék termelésének alakulása. *Népszabadság*, July 27, 1966, p. 10.
- Nagy, M. (1942): Erdélyi állattenyésztési helyzetkép. *Köztelek*, No. 37, p. 840.
- Németh, J., Ferencz, G. (1974): A domesztikált állatfajták védelme és fenntartása. *Állattenyésztés*, Vol. 23, No. 2., p. 17-27.
- Ócsag, I. (1964): A magyar szürke marha és szarvasmarhatenyésztésünk átalakulása. *Búvár*, No. 3, p. 154.
- Ordódy, L. (1884): *A magyarországi állattenyésztők kalauza*. Budapest, OMGE, 280 pp.
- Pabst, W. (1829): *Anleitung zur Rinderzucht*. Stuttgart und Tübingen, 328 pp.
- Papp (1966): Bodó Imrénének írott levél, Kolozsvár.
- Piacsek, A. (1934): A magyarfajta szarvasmarha nagy napjai. *Magyar Állattenyésztők lapja*, No. 20., p. 234.
- Piacsek, A. (1934): Tanulmányúti jelentés a magyar fajta szarvasmarhatenyésztés erdélyi helyzetéről. *Magyar Állattenyésztők lapja*, No. 22., p. 258.
- Piacsek, A. (1933): A hortobágyi szarvasmarhatenyésztés fejlődésének útja. *Magyar Állattenyésztők lapja*, No. 17., p. 185.
- Piacsek, A. (1933): A magyar marha megmentéséért. *Magyar Állattenyésztők lapja*, No. 24., p. 277.

## Bibliography

- Piacsek, A. (1938): *Az alföldi szarvasmarhatenyésztés iránya*. Rádiós gazdasági előadások. Budapest, Pátria, p. 51-64.
- Pirkner, J. (1906): *Állattenyésztésünk a jövőben*. Budapest, Pátria, 33 pp.
- Puy, A. (1943): Jegyzetek. *Állattenyésztők lapja*, No. 10.
- Ratkoczi, O., Maróthi-A., Á. (2003): *A génmegőrzési munka támogatása vidékép-analizálásos testméretek alapján a magyar szürke szarvasmarha fajtában*. XXVI. Országos Tudományos Diákkör. Kaposvár. 36 pp.
- Rochambeau, Chevalet G. (1990): *Genetic principles of conservation*. Edinburgh, Proc. 4th WCGALP, p. 434-442.
- Rognoni, G. (1980): *Defence of animal genetic resources*. (kézirat) Roma, FAO UNEP, Technical consultation, 7 pp.
- Rostafinski, J. (1912): *Die Tierzucht Ungarns*. Wien, Wilhelm Fricke, 178 pp.
- Rostafinski, J. (1906): *Über den Einfluss der Rasse auf die Behaarung des Rindes*. Cracovie, Imr. Univers., p. 693-796.
- Ruisz, Gy. (1985): *A mezőbegyési magyar – erdélyi szarvasmarha tenyésztés*. (kézirat) Budapest, Mezőgazdasági Könyvtár.
- Schandl, J. (1954): *Szarvasmarhatenyésztés. (Cattle breeding)* Budapest, Mezőgazdasági.
- Sambraus, H. H. (1987): *Alte Haustierrassen in Ungarn*. Arche Nova 5. l. 36.
- Schafer, H. (1963): *Tierzucht und Haltung in Steppengebieten*. DLG Verlag, 205 pp.
- Simon, D. (1990): *Data banks and conservation policy*. Edinburgh, Proceedings of the 4th World Congress on Genetic Applied to Livestock Production, XIV, p. 423-426.
- Simonsics, N., Varga, I. (1943): *Magyarország szarvasmarhaállománya és változásának iránya*. (kézirat) Budapest, Mezőgazdasági Könyvtár, 46 pp.
- Smith, C. (1984): *Genetic aspects of conservation in farm Livestock Production Science*. p. 37-48.
- Sperker, F. (1911): *A húsdrágaság és a magyar szarvasmarha*. Kolozsvár, Erd. Jo. Magy. Szm. Teny. Egy., 48 pp.
- Spooner, R. L. (1990): *Genetic of immune responses and their implications for vaccine design and disease resistance*. Edinburgh, Proceedings of the 4th World Congress on Genetic Applied to Livestock Production, XVI, p. 385-387.
- Sterbetz (1979): *Élő örökségünk, génerezű, génbank*. Budapest, Mezőgazdasági, 194 pp.
- Szentkirályi, Á. (1926): *Az erdélyi szürkefajta tehenek tejelése*.
- Szigeti, J. (1959): *A háziállatok korszerű szelekciója*. Budapest, Mezőgazdasági, 275 pp.
- Szunyogh, G. (1936): Beszámoló a magyar–maremenn tenyészetéről. *Állattenyésztők lapja*, No. 19., p. 227.
- Szunyogh, G. (1938): *Beszámoló a kompolti magyar–maremann tenyészet harmadik esztendőjéről*. Budapest, Pátria, 12 pp.
- Thornback, J. (1983): *Wild cattle, bison and buffaloes, their status and potential value*. Cambridge, IUCN, 64 pp.
- Tormay, B. (1885): *A szarvasmarha tenyészközléte az országban*. Budapest, Pesti Könyvnyomda Rt., 21 pp.
- Tormay, B. (1876): *Hazai gulyák ismertetése*. Budapest, Herz, J., 101 pp.
- Tormay, B. (1906): *A szarvasmarha és tenyésztése*. Budapest, Athaeneum, 192 pp.
- Tóth, A. (1943): *Mentsük meg a magyar–erdélyi marhát és többi ősi állatunkat*. Makó, Makói Nyomda, 80 pp.
- Tóth, A. (1931): Tejelő magyar–erdélyi szarvasmarha. *Köztelek*, No. 47., p. 705.
- Tóth, A. (1935): A magyar marha felkarolása. *Köztelek*, No. 47., p. 478.

## The Hungarian Grey cattle breed

- Verrier, E., Colleau J. J., Foulley J. L. (1987): *Evolution de la variance génétique, intra famille dans une population d'effectif limité soumise à la sélection massive*. Lisboa, EAAP 38th Meeting.
- Véghy, S. (1874): *A szarvasmarhatenyésztés. (Cattle breeding)* Budapest, Franklin, 107 pp.
- Vissac, B. (1973): Pour sauvegarder la variabilité du patrimoine génétique un retour possible aux races méprisées. *Élevage*, No. 19., p. 61-65.
- Vuchetich, Gy. (1934): A küllemi törzskönyv kiterjesztése a szarvasmarhánál. *Állattenyésztők lapja*, No. 23., p. 268.
- Wallis, D. (1986): *The rare breeds handbook*. New York–Sydney, Blandford Press Poole, 157 pp.
- Wellmann, O. (1926): *Magyarország állattenyésztése. I. kötet. Szarvasmarha-tenyésztés*. Budapest, Pátria, 287 pp.
- Wellmann, O. (1927): A szarvasmarhatenyésztés időszerű kérdései. *Köztelek*, No. 24., No. 25., No. 26., p. 462., 502.
- Wellmann, O. (1937): A magyar szürke fajtajellegének leírása. *Állattenyésztők lapja*, No. 3., p. 323.
- Wellmann, O. (1940): *A szarvasmarhák bírálata és törzskönyvelése*. 2th Issue, Budapest, Pátria, 140 pp.
- Wilkens, M. (1876): *Die Rinderrassen Mitteleuropas*. Wien, Braumaller, 200 pp.
- Yamada, Y., Kimura, K. (1984): Survival probability in small livestock populations. In: *An. Gen. Res. Cons. by Management, Data banks and training*. Roma, FAO An. Prod. Health Paper 44/1, p. 105-110.
- Zachariss, O. F. (1903): *Die Rinderrassen Österreich-Ungarns*. Wien und Leipzig, Carl Fromm, 98 pp.
- Zlamál, V. (1867): *Az állattenyésztés fontossága a jelenlegi állása Magyarországon*. Pest, 46 pp.
- Zorn, W. (1951): *Rinderzucht*. Stuttgart, Ulmer, E. 264 pp.
- Bikakatalógus* (2000-2004). Magyar Szürke Szarvasmarhát Tenyésztők Egyesülete. 148 pp.
- Eleven örökség* (2001), szerk.: Bodó, I. Agroinform Kiadó, Budapest. 126 pp.
- Képek Magyarország állattenyésztéséből*. (1896) Budapest, FM megbízásból készült fénykép-sorozat, 100 pp.
- La razza Maremmana* (1997). ANABIC kiadvány olasz-angol nyelven. 45 pp.
- Living heritage* (2001), ed.: Bodó, I. Agroinform Kiadó, Budapest. 126 pp.
- A magyar szürke marha eredete* (2000). The origin of the Hungarian Grey cattle. Vitaülés Bugacpuszta. AMC támogatással készült egyesületi kiadvány. 95 pp.
- A szarvasmarha törzskönyvi küllemi bírálata*. MNOSZ (1953): 6802–53, Budapest, 217 pp.
- A szarvasmarha törzskönyvezése*. (1958): 6801–58. Bp. 1958.
- Tenyészmárhák és bivalyok kiállításának katalógusa*. (1896) Budapest, Pesti Könyvnyomda Rt., 152 pp.
- Der Tierzüchter*. (1964) No. 20. Nyugat-Európa szarvasmarhatenyésztése. Olaszország. p. 746-749.
- Der Tierzüchter*. (1965) No. 22. Kelet-Európa szarvasmarhatenyésztése. Magyarország. p. 791.
- A Tiszántúli Szarvasmarhatenyésztő Szövetség Beszámoló Jelentése 1940–41. évi működéséről*. (1942) Debrecen, 26 pp.