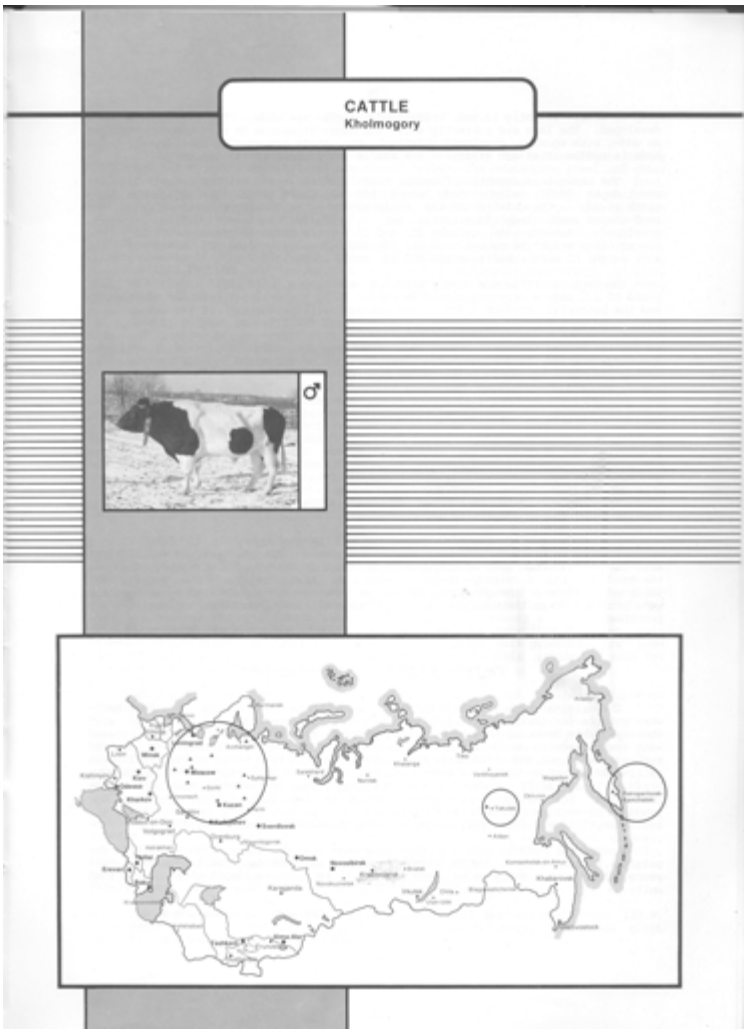


KHOLMOGORY (Kholmogorskaya)

The Kholmogory breed was formed in Kholmogory and Archangel districts of Archangel region. It is the oldest and one of the best breeds in the country. Even in the 17th century Kholmogory cattle were noted for their fast rate of growth and high milk production. The development of cattle breeding in the alluvial plain of the Severnaya Dvina river was aided by the available flood plain meadows and pastures with legume-grass mixtures. Excellent pastures in the summer and liberal feeding with high quality hay in winter were the bases for developing such valuable characteristics as the large size, harmonious conformation and high productivity. The local residents attached much importance to the correct methods of raising the young stock by hand nursing not by suckling; they used special methods of feeding, management and milking of the cows. The first selection of the animals was performed by the Kholmogory peasants as far back as 250 years ago. A considerable economic outlet for the Russian cattle products (butter, beef, tallow, leather) in Europe in the 17th and 18th centuries gave a new impetus to the local peasants to develop dairy and beef cattle breeding.

According to the available historical data the Kholmogory breed had been formed long before foreign cattle were imported into Archangel and the adjacent areas. Kholmogory cattle had been exported beyond the boundaries of their initial habitat in 1693, 1713 and 1728 before they were crossed with foreign breeds. Highly productive Kholmogory cattle were used in various parts of the country for improvement of the local cattle. This intensive export resulted in the decline of the Kholmogory cattle husbandry. First attempts to improve the local Kholmogory cattle by crossing with the Dutch breed were undertaken in 1725, but there are no data available on the numbers of the imported cattle and their influence on the local cattle breeding.

During 1765-1898 cattle from the Netherlands and from Holstein were imported in small numbers into Archangel province. According to Reznikov during that period 137 head of cattle, including 62 bulls, were imported. Nevertheless, the proportion of imported Dutch cattle was very low: in Kholmogory and Archangel districts the cattle population varied at that period from 19 to 23 000; the percentage of cows varied from 52.3 to 72.3. It is difficult to define how great the influence of the imported sires on the Kholmogory cattle was. In a monograph entitled "Kholmogory cattle" by A.A. Vityugov (Archangel 1928) and in the work by F.I. Reznikov under the title "New Data on the History of the Kholmogory Cattle" (Archangel 1949) it was stressed that the influence of foreign breeds on Kholmogorys was slight. Studies of Kholmogory cattle in 1911-12 (A.A. Kalantar) and in 1921-24 (A.A. Vityugov) showed that there are several basic and transitional types within the breed. They differ in conformation and productivity.

In 1913-14 inspecting associations, cooperative dairy plants and mating stations were set up in the breeding zone of the Kholmogory cattle. The National Herdbook of the Kholmogory breed was started in 1927; in 1934 the state breeding station was established. They assisted in the breeding work with Kholmogory cattle by classification and selection of the animals, control of the raising of the replacement young stock, and identification of valuable animals.

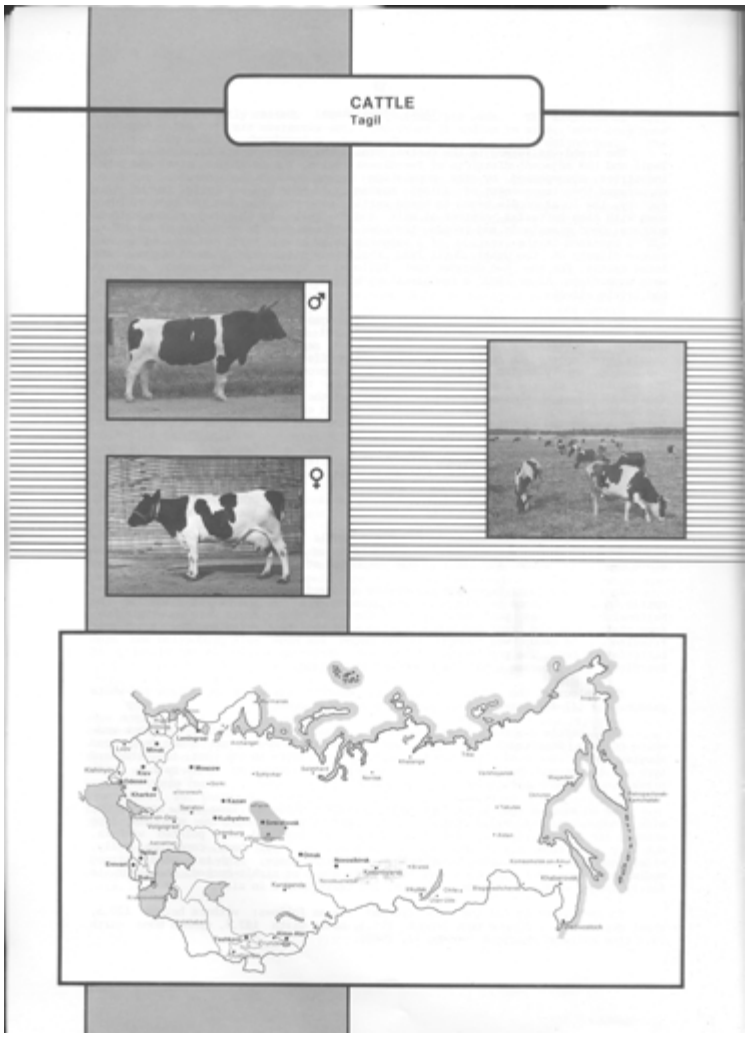
In 1936-37 on some farms a single cross with sires of the East Friesian breed was used to improve milk yield and conformation. The butterfat content of the crosses was considerably lower than that of their purebred Kholmogory parents; therefore crossbreeding was halted and the crosses were deported from the principal breeding zones of Kholmogory cattle. Good acclimatization of the Kholmogory cattle in various parts of the country encouraged their distribution to many republics, areas and regions. At present Kholmogory cattle are bred in 24 regions and republics, mainly in Archangel, Vologda, Kirov, Moscow, Kalinin, Ryazan, Kaluga, Kamchatka regions and in the Komi, Yakut, Tatar and Udmurt ASSRs. Each region or republic has its own specific climatic and feed conditions. The Kholmogory cattle are well adapted in those different geographical areas and show high milk production and such qualities as early maturity, hardiness, strong constitution and resistance to disease. In milk production, among the national cattle breeds the Kholmogory cattle are second after the Black Pied. Kholmogorys are not as productive as the imported breeds but the main reason for this is the low level of feeding and management and insufficiently intense selection and use of sires. In each region where the Kholmogorys are bred there are outstanding animals which are the founders

of the lines, related groups and progenies. These animals should be used for pedigree activities on a wide scale.
By the beginning of 1980 the total population of Kholmogory cattle was 2 407 000.
The constitution of these cattle is strong and conformation is compact. The prevailing colour is black-and-white; less frequently it is black, red-and-white or solid red. These cattle are large; the legs of the cows are upstanding and the body is long. The head is refined and of medium size. The neck is thin. The chest is deep but not wide enough, with a small dewlap. The back and loin are level. The rump is wide, slightly raised. The hindquarters are wide. The skeleton is well developed. The legs are" correctly set. The udder is medium in size; most cows have an udder with equally developed quarters. The teats are usually cylindrical. The hide is medium thick and elastic. The muscle development is satisfactory.
The basic measurements of mature cows (in cm) are: withers height 133-135, chest depth 70-72, oblique body length 160-162, heart girth 196-198, cannon bone girth 19-20. The defects of the conformation are: narrow chest, sloping and roof-shaped rump, legs incorrectly set. Pedigree Kholmogory cattle are well developed. According to volumes 25 and 26 of the National Herdbook (1982), the average live weight of mature cows is 570-590 kg, varying from 480 to 810 kg; the live weight of mature bulls is 820-950 kg, going up to 1170 kg.
Kholmogory cattle are early maturing and have a high milk yield. The milk yield of 370 mature cows registered in volume 25 of the National Herdbook was 5394 kg and the butterfat content 3.93%. The average milk production of 949 mature cows registered in volume 26 of the National Herdbook was 5259 kg ranging from 3313 to 8901 kg. The butterfat content was 3.70-4.79%. The record holders for milk production are as follows: Khana 19 - 5th lactation, 8889 kg of milk, 3.93% fat; Khvoinaya 8 - 3rd, 7350 kg, 4.15%; Khartchevnya 30 - 3rd, 7000 kg, 4.57%; Tsavashka 8090 - 6th, 8010 kg, 4.06%.
In 1983 the highest yields were at the educational and experimental farm of the Kazan Veterinary Institute (Tatar ASSR): the average annual milk yield per cow was 4583 kg of milk and 178 kg of fat; at the breeding station of the Zavet Ilyicha collective farm (Moscow region): 4746 kg of milk, 179 kg of fat. The highest production was displayed the same year by cow Gusenichnaya 682 SH-10510 from Kholmogorski state breeding farm in Archangel region: in the 5th lactation she produced 9804 kg of milk with 3.95% fat and 387.2 kg of fat.
Breeding work with this breed is aimed at the intensive exploitation of its genetic potential in adaptivity and productivity.
The study of the genetic characters of the Kholmogory cattle from various ecological zones by the erythrocyte antigens has shown that one antigen was 10 times more frequent in the herd of Polyarny state farm in Krasnoyarsk territory, than in the herd of Lesnye Polyany breeding centre in Moscow region. The authors are inclined to explain the genetic differences between the populations by a specific gene profile and by the adaptive purpose of some alleles (but other explanations are possible).

The Pechora Type of the Kholmogory Breed

The original Pechora cattle developed in north European Russia (the Komi ASSR) were notable for their adaptability and high milk fat content - 4.0-4.2%. But with these valuable features they had low milk yields. For this reason they were crossed with the Kholmogory breed (1930-47). Later the improved Pechora cattle of desired type of the second and third backcross generations were bred inter se. In 1972 these cattle were given an official status and called the Pechora type of the Kholmogory breed. These cattle produced on the breeding farms of the Komi ASSR are highly productive. For instance, over several years the reproductive state farm Novi Bor produced on average over 4000 kg of milk per cow. Record holders include: Skala 5th lactation, 7343 kg, 4.17% fat; Ajda 4th, 6681 kg, 4.05%; Nauka 5th, 8355 kg.

Animals of Pechora type also have good meat characteristics inherited from the original Pechora cattle. On the natural pastures (without supplemental concentrates) young cattle have a daily weight gain of over 1 kg for a consumption of 6.5-7.0 food units.



TAGIL (Tagilskaya)

The breed was formed in the Central Urals. The centre of its breeding is Nizhny Tagil and the adjacent districts of Sverdlovsk region. The developing steel and other industries, accompanied by the population growth and higher demand for food, encouraged the improvement of animal husbandry in the Urals. Early in the 18th century, the local people began to breed cattle, selecting for use the best yielding cows with high butterfat content of milk and the bulls by the production of their mothers. Good grasslands and keeping the cows outdoors even in cold weather (-20 to -30 C) assisted in the creation of a valuable dairy breed, hardy and adapted to the severe climate of the Urals. Until 1862 Kholmogory sires were used to upgrade the local cattle. For the two decades that followed no systematic improvement measures were undertaken. After 1882 a few Yaroslavl bulls were used for crossing, but they had little effect.

Early in this century the Tagil cattle began to be crossed with the Dutch breed. This resulted in a better constitution and higher milk yield but caused a decrease in butterfat content. According to some reports, Swiss Brown and Tyrolean cattle were imported in small numbers but their effect was not

great. Overall, only two breeds, namely Kholmogory and Dutch, had an improving effect on the Tagil cattle. The popularity of the Tagil breed increased after the cattle exhibition in Nizhny Tagil in 1905 at which the average milk yield of the cows exhibited was 2931 kg and the butterfat content was 4.83%. Thereafter Tagil cattle were in great demand and they were exported in great numbers to the neighbouring districts of west Siberia, to east Siberia and even to Kamchatka.

During the following decade the Tagil cattle were intensively mated to the Dutch breed which resulted in a considerable decrease in the butterfat content of their milk. To preserve a valuable property of the Tagil cattle, that is the high butterfat content, the Dutch sires were replaced by purebred or crossbred Tagil bulls.

Since 1917 the improvement of Tagil cattle has been carried out by the husbandry association set up in Nizhny Tagil; since 1933 this work was done by the State breeding station, and later it was performed at breeding stations.

In 1930 the Tagil breed was officially approved as planned breed for improving cattle in some regions of the Urals and Siberia. In 1931 the first volume of the National Herdbook was published. Late in the 1930s experiments were undertaken at some state farms to cross the Tagil cattle with the East Friesian. The Tagil-East Friesian cattle group was formed; it was noted for high milk production and high butterfat content. The population of Tagil-East-Friesian cattle in the vicinity of Sverdlovsk later became a part of the Black Pied breed.

The colour of the animals is diverse; nevertheless black and black-and-white predominate (47-48%); red and red-and-white are also common.

Tagil cattle are subdivided into three types: Tagil-Dutch, mainly of black-and-white colour; Starotagil (old Tagil) with a somewhat coarse and short deep head showing the influence of Tyrolean and Swiss Brown cattle in the past; the standard type of the second half of the last century, uninfluenced by Dutch cattle, with prevailing red-and-white colour.

The animals of the first type have a lighter skeleton, long head, long body, wide hindquarters, normally shaped udder, correctly set legs. The standard type animals are characterized by fairly heavy and long head and neck, pointed withers, not very deep chest but with a considerable dewlap, level back, capacious belly, wide, long and often sloping rump with a roof-like shape, high tail head, strong medium-long legs. The hind legs are frequently bowed or sickle-hocked. The udder is fairly large, with a good excess of skin. The teats differ in size.

The measurements of the cows (in cm) are as follows: withers height 129.5, chest depth 70.9, oblique body length 158.3, heart girth 187.5, cannon bone girth 19.2 (the National Herdbook, volume 12, 1980).

The constitution of the animals is strong and conformation is compact. The size of the animals is medium. The live weight of newborn calves is 28-32 kg; at the age of 6 months they weigh 160-190 kg. The live weight of cows averages 460-500 kg; that of mature cows registered in Volume 12 of the National Herdbook (1980) is 552 kg (going up to 705 kg). The average live weight of bulls older than 3 years is 836-942 kg. The largest animals reach the weight of 1 000-1 120 kg.

The beef qualities of the Tagil breed are considered to be satisfactory. The dressing percentage of yearling steers is 54; at the age of 17 months it is 58%. Feed conversion is 5.6-7.2 feed units per kg live-weight gain.

The milk yield of cows on the best commercial farms is in the region of 3000 kg; in pedigree herds it reaches 4500-5000 kg. The average milk yield of the cows registered in Volume 12 of the National Herdbook was 3989 kg, with 4.29% fat. The most productive cows of the Tagil breed produce 7323-7805 kg of milk in 305 days with 4.12-4.31% fat.

The record holder of the breed, cow Amazonka 474 is kept at Savinski state farm in Perm district. She produced in 305 days of the 6th lacation 8243 kg of milk with 4.36% fat. Her production per 100 kg of live weight was 1540 kg of milk. In 10 lactations she yielded over 60 000 kg of milk. Cow Lyustra 367 of the same farm produced, in 305 days of the 4th lactation, 7252 kg of milk with 4.31% fat, or 1250 kg of milk per 100 kg of live weight. Cow Rodinka 351 produced in the 5th lactation 10 222 kg of milk with 3.97% fat; Marta 46: 8th lactation, 9367 kg of milk, 4.10% fat; Dorogaya: 6th lactation, 9040 kg, 4.15% fat.

In butterfat content the Tagil cows are second only to the Gorbatov Red breed. The average butterfat content is 4.0-4.2% and some cows have 5.0-5.4%. The herds with the highest butterfat content are on farms of Perm and Sverdlovsk regions, where cows with butterfat content of over 4.0% account for 18-25% of the herd. The protein content is 3.3-3.6%. At the breeding farm of Tagil cattle at Trifanovskoe breeding centre of the Ural Agricultural Research Institute in Sverdlovsk region 1019 cows produced in 1983 an average of 4264 kg of milk and 167 kg of milk fat.

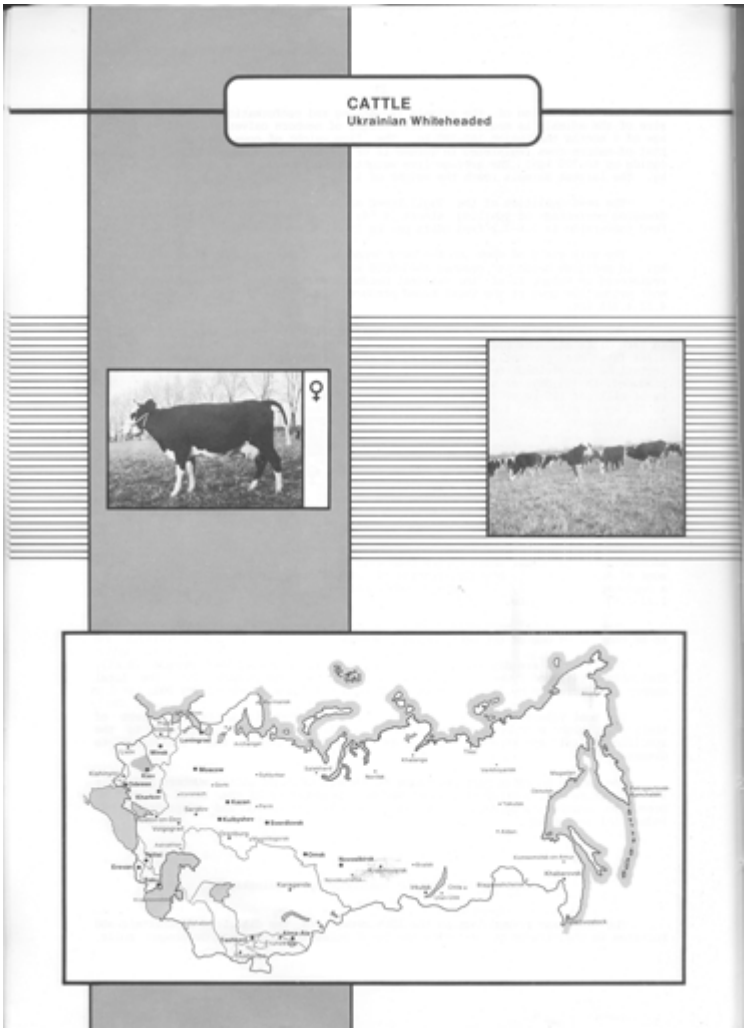
Due to the shape and function of the udder the Tagil cows are suitable for machine milking: udder index varies from 40.7 to 45.2%. At the farms of the service zone of Kamyshlov state breeding station 31% of the cows have a tub-shaped, 59% have a cup-shaped, and only 10% have a spherical udder. The speed of milk flow is 1.22-1.67 kg per minute.

These commercial properties and biological features of Tagil cattle allow them to be considered one of the best national breeds.

Tagil cattle are distributed in Sverdlovsk (46%), Perm (36%), Kurgan (5.8%), Chelyabinsk (4%) and Tyumen (0.2%) regions and in the Udmurt ASSR (8%). The total number has decreased by 13% during the last decade and now stands at 599 000.

The most valuable features of Tagil cattle are the high butterfat content of their milk, high milk production, good beef qualities, complete adaptation to the specific natural and economic conditions of the Ural region and resistance to disease.

The cattle breeding plan envisages the growth of Tagil cattle numbers and their improvement by intra-breed selection and by introduction of the blood of related breeds to improve conformation, to increase milk production and adaptability to industrial technology.



UKRAINIAN WHITEHEADED (Belogolovaya ukrainskaya)

The breed was formed late in the 18th century in the districts of Zhitomir and Korosten in the Ukraine by crossing the local Polesian cattle with Groningen bulls. In the Netherlands the Groningen Whiteheaded cattle were bred as a beef-and-dairy breed, whereas Ukrainian Whiteheaded were selected to form a dairy breed.

At present these cattle populate Kiev, Zhitomir and Khmelnitski regions of the Ukraine. On 1 January 1980 they numbered 230 000.

The colour of the breed is red or black but always with white head, frequently with dark spectacles around the eyes. Some animals also have a white udder, abdomen, lower legs and switch.

The cattle are of medium size with a deep but narrow chest. The head is light, small, bony; the neck is long. The musculature is poorly developed; the skeleton is thin. The development of the udder is satisfactory; it is of medium size with properly placed teats; many cows have rudimentary teats. The skin of the udder is medium thick, with sufficient "reserve"; it is covered with thick, fine hair.

The basic measurements of mature cows (in cm) are as follows: withers height 127.1, chest depth 66.4, chest width 39.5, length of the barrel 151.1, chest girth 182.4, cannon bone girth 18.6.

The constitution is strong and the conformation compact. The live weight of bulls over 3 years old averages 743-807 kg; the record figure is 1100 kg. The live weight of 4-5-year-old cows is 445 kg; the record figure is 700 kg. The milk yield of mature cows registered in the National Herdbook, vol. 6, 1975, was 3815 kg with 3.74% fat. According to the 1981 evaluation the average yield of pedigree cows was 2770 kg of milk with 3.55% fat. At the best breeding farms, Antoniny in Khmelnitski region and Komsomolets Polessya in Kiev region, the average was 4500-4800 kg.

The most highly productive cows yield 6-7000 kg of milk in a 300-day lactation: Gitara 332 - 9th lactation, 7736 kg milk, 3.72% fat, 287.7 kg fat; Gornyachka 9133 -3rd lactation, 6270 kg, 3.90% fat, 244 kg fat. The record milk yield belongs to cow Orbita - 7th lactation, 12 393 kg milk, 3.40% fat. The greatest number of highly productive cows belong to Antoniny breeding centre in Khmelnitski region of the Ukraine.

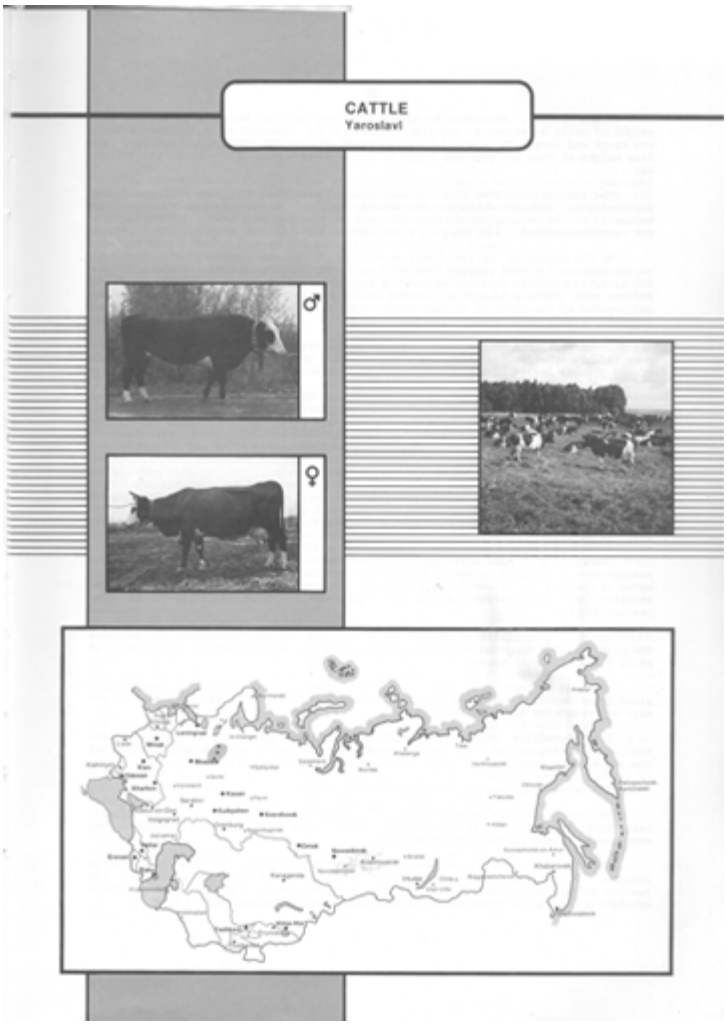
The breed comprises 8 major lines.

A valuable feature of these cattle is that they are nutritionally undemanding. They possess a high feed-conversion efficiency. Among the 1st and 2nd calvers the most productive are the animals with a live weight of over 550 kg. Ukrainian White-headed cattle are well adapted to the local conditions and resistant to diseases.

The major defects of the breed are the low fat content (3.6-3.8%, varying from 3.3 to 4.65%) and that it does not fully meet the requirements of specialized dairy complexes.

It is expedient to further improve Ukrainian Whiteheaded cattle by crossing them with the related Groningen breed.

The conservation of the germ plasm of this breed, in accordance with the long-term plan for cattle breeding in 1980-90, will be done by forming conservation herds at the best farms.



YAROSLAVL (Yaroslavskaya)

The breed was formed in the 19th century in the territory of the former Yaroslavl province as the result of isolation and long-term inter se breeding of the local variety of the northern Great Russian cattle with selection, under conditions of improved feeding and management. The excellent meadows and pastures in the alluvial plains of the Volga, Sheksna, and Mologa rivers contributed to this process. The increased demands for cattle products of the local urban population and the development of butter and cheese industries late in the last century also favoured the formation of this breed. Animals of the Dutch, Tyrolean, Angeln, Simmental, Allgau and Kholmogory breeds were imported into the Yaroslavl province at different times in small numbers. However, these breeds had little effect on the formation of the Yaroslavl breed since the exterior of these cattle differs considerably from that of the imported breeds. Besides, after 1882-83 there were no cattle importations into this region; hence there is no basis to consider their influence on the Yaroslavl breed.

The greatest emphasis in the formation of the Yaroslavl breed was placed on the development of the dairy characters and less importance was

attached to their conformation. This resulted at first in the defects typical of the Great Russian cattle e.g. angular barrel, narrow chest, short sagging hindquarters with poorly developed muscles, wrong stand of the hindlegs. After 1917 the breeding work with the Yaroslavl breed was conducted by the recording associations and peasant breeding stations who faced the problem of improving the conformation of the animals and increasing their productivity.

In 1924 the Provincial Herdbook was started; later it was replaced by the National Herdbook. By 1940 four volumes of the National Herdbook had been published with 12 000 registered animals. Since 1933 the breeding work in the collective farms was conducted through the system of State breeding stations.

Typically, Yaroslavl cows are black with white head, abdomen, lower legs, and switch and with black spectacles around the eyes. The muzzle is dark. Animals of red, solid black, red-and-white or black-and-white colour are less frequent. Considering that cattle colour has no effect on their productivity, no emphasis is placed on it and animals of all colours are entered in the herdbook. Nevertheless, in the pedigree breeding areas black white-headed animals prevail because of customer preference for the typical colour.

Yaroslavl cattle have a somewhat angular conformation and well-developed mid-barrel. The head is light and bony with a relatively small distance between the horns. The horns are medium thick and medium long, light in colour with dark tips. The neck is thin, of medium length and with small wrinkles. The dewlap is not large; the withers are pointed, projecting slightly above the topline; the loin is straight; the hindquarters are almost square but slightly sagging. The mid-part of the barrel is long; the abdomen is capacious. The skin on the barrel is elastic, thin, stretching easily. The legs are not long. The skeleton is usually thin and poorly developed. The udder is well developed; the teats are cylindrical, the front ones widely spread but the back ones sometimes close together; rudimentary teats are frequent. The skin on the udder is thin, covered with soft, thin hair; there are folds of skin at the back.

Bad set of the legs is rarely observed in pedigree animals. Cow-hocked hindlegs are usual. Such defects as sagging hindquarters, pointed rump and bowed hindlegs are very infrequent. With unsatisfactory raising of the young stock the following defects may later appear: narrow chest, hollowness behind the shoulders, poorly developed muscles of the back, loin and rump.

The basic measurements of mature Yaroslavl cows are (in cm): withers height 127-129, chest depth 68-70, chest girth 183-186, oblique body length 155-157, cannon bone girth 17.8.

The live weight of the calves at birth is 28-32 kg. With intensive raising the steers reach a weight of 170-180 kg by the age of 6 months.

Formerly Yaroslavl cattle had a low live weight and a number of conformational defects due to insufficient feeding. Improved feeding and management increased the live weight of cows. According to Volume 17 of the National Herdbook (1979) the live weight of bulls 3-years-old and older is 804-844 kg (maximum 960 kg). The animals are large and long. The average live weight of cows is 483 kg (maximum 649 kg). The live weight of cows on pedigree farms is 500-580 kg; that of the bulls is 700-800 kg.

The Yaroslavl cattle have for many years been noted for high milk yield and especially for high fat content. The average yield of the mature cows registered in Volume 17 of the National Herdbook (1979) was 3943 kg (maximum 6855 kg). The butter-fat content averaged 4.14%, varying from 3.98 to 5.19%.

By the beginning of 1941 there were over 20 record holders in the Yaroslavl region with milk yields ranging from 6000 to 11 700 kg. Cow Zolotaya produced in the 4th lactation 9267 kg of milk with 4.15% fat. Her lifetime milk yield was about 80 000 kg. Cow Marta produced in the 5th lactation 11 690 kg of milk. The highest daily yield in the USSR, 82 kg, was produced by cow Vena, in a 300-day lactation she produced 8438 kg of milk with 4.0% fat.

Cow Boyarka produced a record yield: 5th lactation, 8795 kg, 4.11% fat. Some cows had high yields for a number of lactations. Thus the annual average milk yield of cow Tainaya for 17 lactations was 4218 kg of milk.

The best herds of Yaroslavl cattle are as follows: the breeding centre of Gorshikha collective farm in Yaroslavl region, Svetoch breeding centre in Ivanovo region and Sheksna collective farm in Vologda region. In the first herd the average milk yield in 1983 was 4697 kg and of milk fat 221 kg; in the better years it reached 5020 kg and 4.60% fat. According to the catalogue of highly productive animals (1983) the highest milk yield was in the herd of Svetoch breeding centre, which averaged 4260 kg of milk and 163 kg of milk fat.

This leading pedigree establishments have bulls with highly productive female ancestors. Zhitomir 181 is the son of a cow that yielded 7464 kg of milk at 4.39% fat or 327.7 kg of fat; Granit 775: dam gave 7281 kg of milk, 4.43% of butterfat, 322.5 kg of fat.

The animals of this breed are early maturing: at Gorshikha breeding centre the average age of heifers at first calving is 2 years and 5 days. Some heifers are mated at the age of 14 months and calve at the age of 23.5 months; in the first lactation they average 3900 kg of milk with 3.6% fat. The live weight of cows reaches 530 kg.

The strong constitution of cows ensures longevity and the ability to increase the milk yield; many animals are highly productive and fertile up to the age of 15-20 years.

High fat content of the milk of Yaroslavl cows is combined with a considerable protein content (3.5-3.6%) and dry matter content (13.6%). The cheeses made from the milk are noted for high quality.

Under intensive raising the beef and fattening qualities of the Yaroslavl cattle are satisfactory: the animals produce carcasses of a sufficient weight and their dressing percentage is 52.7; the beef is tender and tasty.

The breed comprises 15 lines and related groups.

The most valuable properties of this breed are rich milk, high milk yield, resistance to tuberculosis, brucellosis, infectious mastitis and leucosis, high response to better feeding and management.

The Yaroslavl cattle are bred in Yaroslavl, Ivanovo, Vologda and Kalinin regions. The total population in 1980 was 927 000. It is expedient to improve the feeding at the leading breeding stations and to improve the selection so that these cattle could meet the requirements of modern industrial technology.