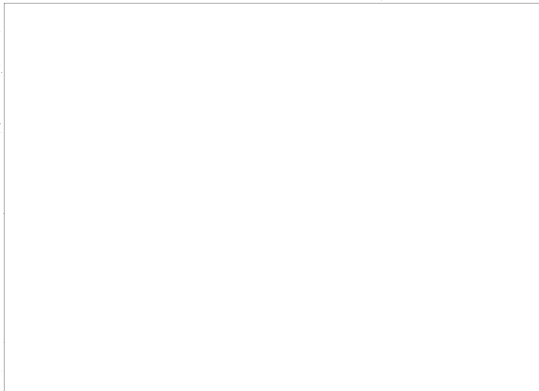


Soviet and Bulgarian Livestock  
Govedovudstvo, Sofia, 1950



**RESTRICTED**REGIONAL APPORTIONMENT OF CATTLE BREEDS IN BULGARIA

On 28 and 29 June 1947, the Supreme Livestock-Raising Council was convened in Sofia in order to revise and introduce substantial changes in the prevailing regional apportionment of cattle breeds in the country. After extensive investigation regarding the regional apportionment of cattle breeds, the Supreme Council decided upon the following areas for the various cattle breeds in Bulgaria.

**A. BREEDING AREAS**

1. The breeding area for Bulgarian grey cattle is to include the following okolias: Pleven, Lovech, Sevliev, Troyan, Teteven, Lukovit, Pavlikeni, Oryakhovo, Byola Slatina, and Svish-tov Okoliya up to the Yantra River; Plevan is to be the center of the area.
2. The breeding area for brown Swiss cattle is to include the following okolias: Sofia, Breznitsa, Samokov, Godech, Trun, Novo Selo, Pirdop, Panagyurishte, and Klisurskiya Manastir (Berkovitsa area), with Sofia as the center of the area.
3. The breeding area for Simmenthal cattle is to include the following okolias: Vidin, Kula, Bialogradchik, Mikhaylov-grad, and Lom, with Vidin the center of the area.
4. The breeding area of shorthorn Rhodope cattle is to

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include the following okoliyas: Smolyan, Devin, Ardin, and the mountain settlements only of Zlatograd, K'rdzhali, Momchilgrad, and Nevrokop okoliyas.

5. The breeding area for red Sadovo cattle is to include the area around the town of Sadovo and the Cooperative farms in Plovdiv and Varna okoliyas.

In the above-named breeding areas, only the respectively designated breeds of cattle will be raised in their purebred state.

The import into a breeding area of bulls other than the breed designated for the given area is prohibited, regardless of whether they are destined for cooperative or other public stock-raising enterprises.

The cooperative and other stock-raising enterprises in the breeding areas are to serve as centers for the raising of breeding cattle of the breed designated for the area.

**B. DISTRIBUTION AREAS**

The distribution areas are to include those parts of the country which are not included in the breeding areas. In these, the breeds of cattle listed above are to be distributed as follows:

1. All of northern Bulgaria other than Berkov Okoliya is

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designated as a distribution area for Simmenthal and Bulgarian grey cattle, where the cooperative and other public stock-raising enterprises will raise, according to their preference, either Simmenthal or local grey cattle, and village communities will keep for individual farms bulls of the Bulgarian grey breed only.

2. All of southern Bulgaria and Berkov Okoliya are designated as distribution areas for brown Swiss cattle and Bulgarian grey cattle, where the cooperative and other public stock-raising enterprises will raise either brown Swiss or local grey cattle, according to their preference, and village communities will keep bulls of only the Bulgarian grey breed for individual farms.

3. In the distribution areas, the town and village communities, and the cooperative and other public stock-raising enterprises located in the vicinity of important centers of consumption -- Plovdiv, Stara Zagora, Yambol, Svilen, Burgas, Khas-kovo, Gabrovo, Turnovo, Gorna Oryakhovitsa, Ruse, Kolarovgrad, Stalin, Tolbukhin, and Silistra --- are allowed to keep bulls of both the Bulgarian grey and other breeds.

In the distribution areas, bulls may be raised in accordance with the requirements provided for by the regulations for the organization of the raising of purebred bulls, and according to the examination of their pedigrees in conformity with the regulations relating to the general survey of male breeding animals in the country, published in numbers 140 and 293 respectively of the Official Gazette for 1946.

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Even the above regional distribution of the raising of purebred cattle in the country is not definitive, and is expected to be fundamentally revised, corrected, and finally defined at later dates.

### HOLSTEIN CATTLE

#### Holstein Cattle in the USSR

The first import of Holstein cows and bulls into Russia was effected toward the end of the sixteenth century upon the express order of Emperor Peter the Great. The first attempts at acclimatization in Czarist Russia failed, except for Arkhangel'sk Guberniya, because of the radical differences in living conditions from the original breeding areas in Holland. Only in Arkhangel'sk Guberniya, where conditions are close to those prevailing in Holland, was the crossing of local cattle with the Holstein breed successful. From this cross, the Khol'mogorsk breed, distinguished by high milk productivity, was developed. Only later were Holstein cows and bulls often imported into landholders' estates in various parts of Russia. With few exceptions, thanks to poor care and unsatisfactory feeding, Holstein cows in all parts of Russia underwent a considerable deterioration of their desirable characteristics and showed signs of rapid degeneration. A large number of Holstein cows and bulls became infected with tuberculosis and other contagious diseases. At the same time, in some parts of the country with better pasture and forage

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facilities, the crossing of local and Holstein cattle produced crossbreeds that excelled by much higher live weight and milk productivity the local cattle used as a base. The crossbreeds of local and Holstein cattle are today found not only in the central part of the USSR along the course of the Volga, but also in Alius-Ata (now Dzhambul), the Kazakh SSR, the Kirghiz SSR, in Siberia, etc. The Holstein breed has had a part in the creation of many Russian breeds — Khol'mogorsk cattle, red Steppe cattle, Bestuzhev cattle, white-headed colonists' cattle, and in all probability Yaroslavl' cattle as well. And finally, the shorthorn cattle, which is now common in the USSR, also has Holstein blood in it. According to the investigations of Academy Member Liskun, before the October revolution about 22 percent of the cattle inventory of the landholders' estates were of the Holstein and Frisian breeds. After the October revolution, Holstein and Frisian cattle found even wider distribution in the USSR. On the large farms — State, Collective, Breeding, and Commodity farms — the necessary conditions such as comfortable and sanitary stables, forage sufficient in quantity and variety, etc, were developed for the successful raising of pure breeds of cattle such as Holstein. Thus, the dairy herd of the Lesnaya Polyana State Farm consists of Holstein-Frisian cows and crossbreeds of local cows with Holstein-Frisian bulls of good bloodlines. The average yearly milk production of a herd cow on this state farm in 1932 was barely 2,127 kilograms; six years later (1938), the average yearly milk production was 5,089 kilograms, or an increase of approximately

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3,000 kilograms. This unusual increase in the average yearly milk production of the cow herd on the Lesnaya Polyana State Farm is due to the high level of care and feeding.

With good care and feeding, Holstein and Frisian cattle in the various areas of the USSR have demonstrated very good adaptability and acclimatization characteristics.

According to 1940 census data from the State Breeding farms of the USSR, purebred and crossbred (from Holstein-Frisian bulls and local cows) animals had the following live weight and milk productivity:

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Pedigree	Number of Cows		Live Weight		Milk Production		Butterfat Percentage
	after 1 calf	after 3 calves	after 1 calf	after 3 calves	after 1 calf	after 3 calves	
Purebred animals	176	115	519	557	4,059	6,080	3.24
First-generation crossbreeds	78	187	523	524	3,010	4,856	3.44

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The above figures show that the average milk production throughout the lactation period (300 days) of purebred cows after their third calf was 6,080 kilograms, and that of crossbred cows of the first generation was 4,856 kilograms. Even in these two groups of cows, the average milk production is admittedly very good. The figures for live weight are likewise fairly high and show that on the State farms both purebred and crossbred cows are receiving very good care and feeding. On the State Breeding farms, 121 cows showed an average milk production of 6 to 7,000 kilograms per lactation period (300 lactation days). The best known State Breeding farms in the USSR are now the "Molochnoye" and the farms in Vrachevye Gor'kiy, Torosovo, and Omsk.

Data on the average milk production of Holstein cows on these farms are shown in the following table:

State Breeding Farm	Number of Cows	Milk Production throughout lactation period (300 days) kg.
Molochnoye	51	6,384
Vrachevye Gor'kiy	17	6,207
Torosovo	26	6,773
Omsk	21	4,383

The high average milk production figures of purebred Holstein cows and crossbreeds derived from them on the State farms put them on the same level with the best known cow herds in the capitalist countries.

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This is undoubtedly a great achievement of socialist stock-raising. The following cows show the highest milk production:

Name of cow	Number of calves (to date)	Milk production (300 days)	Butterfat percentage
Dina II	4	9,029	3.35
Elena	7	9,597	3.05
Veronika	2	9,022	2.90
Selektsiya	3	9,042	3.42
Pampa	5	9,918	3.37
Luna	10	9,165	3.13
Pechka	3	10,204	2.90
Dol'da	7	9,595	2.76
Zabel'	4	9,257	3.20

The Holstein-Frisian breed is widespread in the Lenin-grad, Vologda, Moscow, Gor'kiy, Kirov, Sverdlovsk, Omsk, Novosibirsk, and Irkutsk oblasts, in the Krasnoyarsk, Khabarovsk, Primor'ye, and Alta krays, in the Uzbek SSR, and elsewhere.

Holstein Cattle in Bulgaria

A limited number of Holstein cows and bulls were imported into our country as well as into Russia. This breed has had a part in the development of red Sadovo cattle, with Angeln cattle as a base.

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The Purvi May Knitwear Plant in Stalin acquired a herd composed primarily of Holstein cows. Since bulls of the Simmenthal and other breeds are admitted to this herd, the cows are heavier and larger than purebred Holsteins.

Here and there, animals with black spotted coats are found, showing that some infusion of Holstein blood must have been allowed in the past in other villages and areas of the country as well.

#### KHOL'MOGORSK CATTLE

Khol'mogorsk cattle have the highest milk production of all the breeds in the USSR today. They are bred along the lower course of the North Dvina River in the Khol'mogorsk and Arkhangel'sk oblasts. Khol'mogorsk cattle are the result of a cross between local cattle and the Holstein breed, and are well known to have been in existence as far back as the eighteenth century. At that time, on the large cattle market in Moscow, this cattle breed was much sought after and appreciated. Crossbreeding of local cattle with Holstein has been attempted in other areas of the country also, but because of the extremely favorable conditions, the Khol'mogorsk area was the only one to produce a breed of dairy cattle, the Khol'mogorsk breed. The Khol'mogorsk cattle-breeding area excels by its coastal island pasture lands and meadows with rich grass cover consisting mainly of sweet grasses and papilionaceous plants. The grasslands cover 70 percent of the total utilized

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land area. During the pasture season, cattle graze day and night on the rich pasture lands. Two types of Khol'mogorsk cattle can be distinguished: one heavier and not too productive, closer in its internal and external features to the local cattle (the base), and the other a slighter and smaller type of high productivity, which is closer in both internal and external features to the improving breed. A relatively sturdy and highly productive dairy breed has been developed in this area because of the consistent crossbreeding of the local cattle with Holstein, favorable natural conditions, the systematic improvement of breeding methods, and careful selection. The breed now holds first place among all the dairy cattle breeds of the USSR. It must also be noted that the Khol'mogorsk cattle are not yet completely balanced and consolidated as a breed.

Description

The Holstein type (slighter) cattle are distinguished by a light build with well-developed body, deep and wide chest, and well-developed rump. The neck is medium long and flat. The extremities are medium long, but well placed. The bones are thin, but strong. The animals of the heavier type are distinguished by heavier build which can be quite coarse. The head is coarse, with the face parts quite elongated. The horns are massive and the legs are long. The chest is shallow and narrow.

The Khol'mogorsk cattle have a round, bulky, but not swollen belly, long protruding ribs with sizeable spaces between. The

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back is broad and level. The udder is well developed (abdominally placed) and with a good back part. The skin is thin, elastic, loose-fitting, and forms many fine creases at the neck. The color of the coat is black-spotted, but many red-spotted and other colors occur as well. The live weight of adult cows averages 450 to 500 kilograms, and of bulls 700 to 850 kilograms. Cows of herds given good care can achieve live weights of up to 600 to 650 kilograms. Slaughter weight, depending on the degree of preservation, is from 50 to 60 percent of live weight. The meat of fattened animals is tender and tasty. The average yearly milk production is between 3,000 and 3,200 kilograms. Outstanding cow herds have achieved much higher yearly milk production. For instance, the average yearly milk production of Khol'mogorsk cows on the Par-golovo State Farm was 5,120 kilograms as far back as 1928, on the Siverskoye Collective Farm 5,029 kilograms, etc. At the Timiryazev Academy in Moscow, a herd of Khol'mogorsk cows during 1944 had an average live weight of 638 kilograms and an average yearly milk production of 4,316 kilograms with 3.63 percent butterfat content.

At the Moscow Agricultural Exhibit of 1939, a large number of Khol'mogorsk cows and bulls were shown. Of these, 143 cows had an average yearly milk production record of 6 to 7,000 kilograms, 49 of 7 to 8,000, 18 of 8 to 9,000, 4 of 9 to 10,000, and 3 of over 10,000. On the Ostakhovo State Farm in Vologda Oblast, milker Serafima Aleksandrovna Maslova obtained 78.9 kilograms of milk from the Khol'mogorsk cow Vol'nitsa on 4 September 1941. This maximum daily milk production is a world's record.

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Later, the Yaroslavl' cow Vena broke Vol'lnitsa's world's record by yielding, on 19 February 1941, a maximum milk production of 82.15 kilograms.

Most famous is the use of the bloodlines of Sviren I, Khol'mogorets 70, and Hercules. The daughters of the bull Sviren I have shown a greater milk production than their dams. The average milk productivity of the daughters is 4,725 kilograms, that of the mothers 2,980 kilograms, which is a difference of 1,745 kilograms in favor of the daughters. The bull Saturn X-102, who belongs to the bloodline of Sviren I, has sired 16 daughters with an average milk productivity of 7,039 kilograms throughout 300 lactation days. The cows of Khol'mogorets 70's line have had average milk productions of 5,125 kilograms with 3.41 percent butterfat content and average live weights of 577 kilograms. Hercules' line likewise gives good performance figures, but in comparison to the first two lines has lower milk productivity. The cows of this line have an average milk production of 4,495 kilograms with 3.25 percent butterfat content, and average live weights of 556 kilograms.

**TAGIL CATTLE**

The breeding areas for Tagil cattle are the Omsk, Chelyabinsk, Sverdlovsk, and other oblasts. The origin of Tagil cattle is closely linked to the development of metallurgy in the Urals during the eighteenth and nineteenth centuries. The industrial wor-

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kers had a great need for meat, milk, and dairy products which could be satisfied by a more highly productive breed of cattle.

Tagil cattle are derived from a crossing of local cattle — first with Holstein, and then with Khol'mogorsk. Since the second half of the nineteenth century, Tagil cattle have been inbred, but since the beginning of the twentieth century have again been crossed with Holstein.

The Tagil breed is balanced. Thanks to their high productivity these cattle have found wide distribution not only in the Ural area and the European parts of the USSR, but also in remote sections of Siberia.

The coat color is black or black-spotted. Animals with red, red-spotted, and other coat colors are found less often. Adult cows have an average live weight of 500 to 600 kilograms and an average yearly milk production of 2,000 to 2,500 kilograms with 4.1 to 4.2 percent butterfat content. The cows registered in the second volume of the General Herdbook (GPK) have an average live weight of 600 to 670 kilograms, and the bulls average 1,000 kilograms. The average yearly milk production of cows eligible for registration in the General Herdbook is 3,210 kilograms, with 4.1 percent butterfat content. The record milk production of 51.5 kilograms for a single day was reached by the cow Sestrichka. Tagil cattle are distinguished by good acclimatization qualities, great vitality, and resistance. This is an animal of medium maturation and long life. For the improvement of Tagil cattle, pure

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breeding, selection, and good feeding are used, and Holstein-Frisian blood is from time to time infused into its veins. The objective is the retention of sturdy animals of good exterior and high milk production with high butterfat content.

**YAROSLAVL' CATTLE**

In terms of classification, these cattle may also be included among the dairy breeds. According to its craniological features, Yaroslavl' belongs to the species *Bos taurus primigenius*.

Some authors feel that this line is a result of the crossing of local cattle with the Holstein and Khol'mogorsk breeds, without being able to determine the time at which this crossbreeding took place. According to other authors, it is descended from Northern Great Russian forest cattle.

The breeding area includes all of Yaroslavl' Oblast. In addition, this breed is also found in some of the rayons of the Ivanovsk, Vladimirovsk, Kalinin, Leningrad, Omsk, Sverdlovsk, Chelyabinsk, Vologda, and Gor'kiy oblasts. Its coat color is black or red with a white head; in some animals the belly, feet, and brush of the tail are white as well. The line has a symmetrical body build. The head is lean, delicate, with elongated face line. The body is lean, blocky, with well-developed dairy characteristics. The live weight of adult Yaroslavl' cows varies over a

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wide range, from 370 to 466 kilograms, and the live weight of bulls ranges between 450 and 800 kilograms --- one bull having achieved the record weight of 1,000 kilograms. The milk productivity of Yaroslavl' cattle is considered good. Before the revolution, rural Yaroslavl' cows under small-farm conditions yielded on the average 1,500 to 2,000 liters of milk with a butterfat content of 4.1 to 4.2 percent. After the October revolution, under conditions of collective farming, the live weight has risen considerably and their milk productivity has doubled --- in the better herds it has even trebled.

Caption, Figure 12: Yaroslavl' cow

161 Yaroslavl' cows shown during the Moscow Agricultural Exhibit of 1939 had yields as follows: after their first calving, 3,742 kilograms of milk; after their second calving, an average of 4,407 kilograms; and after their third or subsequent calving, an average of 5,170 kilograms. Of all the cows shown, 22 gave more than 6,000 kilograms of milk with a butterfat content of 3.93 percent. The greatest milk productivity was shown by the following cows: Zolotaya Ya-3305 of the Krasnyy Kolkhoznik Collective Farm after her fourth lactation of 365 days gave 9,267 kilograms of milk with a butterfat content of 4.15 percent; the cow Milka, during her seventh lactation, gave 9,979 kilograms of milk with a butterfat content of 3.9 percent; and the cow Marta, during her fifth lactation, gave 11,519 kilograms of milk.

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The Yaroslavl' breed has also produced a world champion: the cow Vena with a live weight of 480 kilograms, of Domshinskoye gnezdo in the Vologda Oblast; on 19 February 1941, in her fourth lactation, forty days after calving, she gave 82.15 kilograms of milk. On the day that she broke the world's record, she was milked eight times during the 24-hour period by the famous milker Nina Ivanovna Gruzdeva. As with many other breeds of the USSR, so with the Yaroslavl' breed -- the consolidation process is the primary objective of early breedings. Now the breeding objective is to increase milk production and butterfat content, and to produce animals with symmetrical body build and healthy constitution. A special decree of the Ministerial Council authorizes the Yaroslavl' district to raise breeding bulls.

**ANGELN CATTLE**

These cattle are bred for the purpose of milk production and belong to the dairy type of cattle. The line's breeding area is the Angeln Peninsula, which is an area of hardly 1,100 square kilometers. The mild oceanic climate, the light and fertile soil, and the not too luxuriant growth of grass have all helped to produce a medium-sized and highly productive breed. It is accepted as an established fact that the Angeln breed has developed by way of selection from local cattle, without the admixture of the blood of other breeds. If the relatively small live weight is taken into account (450 kilograms), Angeln cattle hold first place in milk production among all improved breeds of beef cattle. Thanks

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to its small stature, Angeln is the only one of all German lowland breeds to have remained uninfluenced by crossings with English beef breeds such as shorthorn or Hereford.

Description

Angeln cattle belong to the medium-sized breeds. The line has medium maturation, and is of a lean, balanced, and noble shape. The color of the coat is reddish brown, more pronouncedly so in bulls. Some animals have small white spots over the belly and udder, which are tolerated in selection. The brush of the tail is black and sometimes has some white strands in it. The muzzle, mucous parts, and hooves are dark in color. The skin has dark pigmentation, is thin, elastic, and loose-fitting. The hairs are short and fine, lie close to the body and are very glossy. The skin at the neck forms many fine creases. The head is long and narrow, lean, noble, and well-modeled. The eyes are large, lively, and friendly. The horns are slender, white with black tips. The neck is not very muscular, sufficiently long, but has no prominent dewlap. The withers are pointed, but low. The back is long, straight, and pointed. The mid-section is long and medium wide. The rump is wedge-shaped, pointed, with strongly convex bulges behind the thighs. The tail is thin, long, and bent inward. The shoulder is not very muscular and somewhat steep. The ribs are long, but flat, which makes for a deep but flat chest. The legs are thin, not very muscular, and straight. The udder is well-developed and well-shaped. Angeln cows have a typical belly udder. The milk veins are strongly protruding and quite visible;

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the teats are large. Angeln, being a very pronounced dairy type, has a lean, blocky, and delicate body with very well-developed dairy characteristics. The average live weight of adult cows is 450 to 500 kilograms, of bulls 600 to 800 kilograms. The average yearly milk production runs from 3,200 to 3,500 kilograms with a butterfat content of 3.4 percent.

Throughout the year 1937, 31,021 Angeln cows were checked; they showed an average yearly milk production of 3,559 kilograms with a butterfat content of 3.57 percent, that is, 127 kilograms of butter. Angeln cows exhibited at the shows organized by the Reichsnahrstand in Germany from 1924 to 1936 had an average live weight of 531 kilograms, that is, 160 kilograms less than low-land Holsteins shown over the same period. The body measurements of the Angeln and Holstein cows exhibited appear on the comparative table below. (Following page)

The Angeln cattle breed utilizes its fodder well, but since it has relatively small live weight and a not very muscular body, it has little meat value. Being animals adapted to the production of milk, Angeln cattle have small capacity for work. In the recently published first volume of the herdbook for Angeln cattle, the following characteristics are required: dark red color, long and narrow head with dark muzzle, long and thin horns, white with dark tips. Long, flat neck; long and thin tail. Loose skin. Large udder and teats. The udder is large and thin-skinned, with outstanding milk veins. The scan care given Angeln cattle in calf-

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hood and the raising of adult animals under difficult conditions have made it a breed of hardy and easily adaptable animals, capable of being raised in countries and regions of more severe and radically different conditions from their breeding area.

BODY MEASUREMENTS OF ANGELN AND HOLSTEIN COWS

	Bulls of 4 or more years		Cows of 4 or more years	
	Holstein	Angeln	Holstein	Angeln
Age in months	65	57	89	74
Live weight	1,100	920	695	531
Height at withers	148	145	135	131
Height at back	146	143	135	130
Height at midscotion	146	143	136	131
Depth of chest	86	83	75	70
Width of chest	62	55	48	41
Body length	182	183	162	159
Girth at windpipe	24	21	19	17

Cows and bulls for breeding purposes are exported from the breeding area into Denmark, Sweden, Finland, the Baltic countries, and the USSR. Bulgaria as well has on several occasions imported Angeln cows and bulls which have served as a base for the breeding of red Sadovo cattle. During 1939, the original Angeln bulls Kom and Klas, with well-known good pedigrees, were imported to refresh, and infuse new Angeln blood into, the herd of the Sadovo

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Central Agricultural School.

Angeln Cattle in the USSR

Angeln cattle were for the first time imported into Russia during the eighteenth century. As far back as 1869, at the first all-Russian exhibition, Angeln cows and bulls were shown. Angeln cattle have served as the base for developing the Ukrainian Steppe breed. In addition, the line has entered into the development of other Russian breeds of cattle. After the October revolution, Angeln cows and bulls were on several occasions imported into the USSR.

According to the published results of the 1940 appraisal of Angeln cattle on the State farms, cows after three or more calvings had a live weight of 473 kilograms and a milk production of 3,026 kilograms. On the Khomontov Breeding Farm, Angeln cows during 1940 had a milk production of 5,436 kilograms. On the Lesnaya Polyana State Farm, Moscow Oblast, Angeln crossbreeds of the second and subsequent generations of over 5 years of age gave on the average 5,461 kilograms of milk with 3.5 percent butterfat content. Angeln cattle, together with red Danish cattle and brown Latvian cattle, are used for inbreeding as well as for the improvement of local primitive cattle in many of the oblasts and republics of the USSR: in the Latvian and Estonian SSR, in the Novgorod, Pskov, and Velikiye Luki oblasts, in the Belorussian SSR, etc.

Caption, Figure 13: Angeln Bull

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**RESTRICTED****RED SADOVO CATTLE**

Of all the breeds of cattle that are represented in our country, red Sadovo cattle have the best developed dairy characteristics. The breed is the product of a complex crossbreeding process in which three improved breeds have participated: Angeln, Simmenthal, and Holstein. Sadovo cattle have been developed by the infusion of Holstein and Simmenthal blood into an Angeln base. Thanks to careful selection and unconsciously permitted close inbreeding, the red Sadovo breed is pretty well balanced and consolidated. The infusion of Simmenthal blood has given it a healthier bone structure and a more massive body build, and the Angeln blood has given it the lean and noble shape and the very well-developed dairy characteristics. The infusion of Holstein blood has at least shown itself in the preservation of good milk production.

Description:

The coat color is reddish brown of various gradations. Bulls show more pronounced color than cows. The head is medium long, narrow, lean, delicate, and well-modeled. The muzzle, mucous parts, hooves, and the brush of the tail are of a darker color. The horns are small and often not too firmly or symmetrically placed on the head. The skin is thin, elastic, and loosely fitting. The hair is thin, lies close to the skin, and is very glossy. The neck is thin, with many creases, and a medium-sized

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dewlap. The back is straight, but some animals with bent back are also found. The rump is wide, even, and long. Some animals with somewhat sloping and wedge-shaped rumps also occur. The tail is long, thin, and well-placed, but some animals with typically cow-like (camel-like) placement and knock-kneed front legs are found. The belly is bulky but not swollen. The body is lean, medium long, blocky, and not very muscular. The udder is well-shaped and developed and covered with short hairs. The teats are medium-sized and of a regular, cylindrical shape. Some cows are

Caption: Figure 14, Red Sadovo Cow

polymastous, i.e., have more than 4 teats. The color of the udder is light red. Red Sadovo cattle form a pronounced dairy type. The 24 red Sadovo cows measured by us have a height at the withers of 135 centimeters, while the cow Tashenka measures 146 centimeters. Average body length is 147 centimeters; the maximum is 169 centimeters. Milk productivity is relatively high. From 2,112 kilograms in 1889, the average yearly milk production of the cow herd of the Sadovo Central Agricultural School rose to 4,524 kilograms in 1935. Because of scanty feeding during the war and the following 3 years of poor crops, the average yearly milk production of the herd has fallen again to between 3,500 and 3,800 kilograms with 3.4 to 3.5 percent butterfat content. The cow Ynitsz II gave 8,376 kilograms of milk throughout one lac-

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tation period, with a butterfat content of 3.4 percent, i.e., 287.1 kilograms of butter. Tota gave 8,305 kilograms throughout one lactation period. These are record figures for red Sadovo cattle. The cow Aleksandra gave 6,066 kilograms throughout one lactation period, Belka 5,776 kilograms, Tamara 6,320 kilograms, Melaniya 6,071 kilograms, and Nikita 6,237 kilograms. In comparison with all other improved breeds enjoying better care and feeding on other State farms, the red Sadovo still has the highest average yearly milk productivity. The live weight of adult cows varies between 450 and 600 kilograms, of bulls between 700 and 800 kilograms. The red Sadovo breed is represented in the villages of the dairy supply belts of the towns of Plovdiv, Stalin, and Pazardzhik. Isolated animals of this breed are also found in the Sofia area and around all larger consumption centers. In large numbers, red Sadovo cattle are found in the village of Vladislavovo and other villages of Stalin Okoliya.

In the latest regional apportionment, all of Dobrudzha has been assigned to red Sadovo and red Steppe cattle.

Red Sadovo cattle, as a well-defined dairy type, have little capacity for work. The beef-fattening qualities are also poor. Nowadays red Sadovo is represented in those villages and areas where it is used almost exclusively as a dairy animal. According to the latest regulations on the regional apportionment of cattle breeds in the country, the village of Sadovo has been set aside as the breeding area<sup>s</sup> of the red Sadovo line, in addition to

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the Cooperative farms in Plovdiv and Stalin okoliyas, and the center of the breeding area remains at the Sadovo Central Agricultural School. From 1939 to 1948, the Sadovo Central Agricultural School used two original Angeln bulls, Kom and Klas, to service its cow herd.

Finally, in Plovdiv, Asenovgrad, and Purvomay okoliyas, red Sadovo cow herds have been established at the Cooperative and Cattle farms. The more productive cows of these herds give a maximum of 25 - 38 - 30 kilograms of milk per day.

According to the latest census of domestic animals by breed, the number of red Sadovo cattle and the red Steppe cattle constitutes about 0.96 percent of the total cattle inventory of the country.

**RED DANISH CATTLE**

The native land of this breed is Denmark, but it is found in other countries as well (Sweden and Norway). Red Danish is the product of crossbreeding of local cattle (which in turn are descended from Holstein) principally with Angeln, from which Danish cattle inherited their red coat color.

Red Danish is a specialized dairy breed. It is quite well balanced externally and has well-developed dairy characteristics. The live weight of adult cows averages 500 to 550 kilograms, and that of bulls ranges between 700 and 800 kilograms. Average yearly

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milk production is 3,500 to 4,000 kilograms with a butterfat content of 3.8 to 4.2 percent. Red Danish cows and bulls were imported to Russia even before the revolution. A large shipment of Danish cows and bulls entered the USSR in 1934, when they were placed in the care of State farms in the Moscow and Leningrad oblasts. According to appraisal results, Danish cows after their or subsequent calving have averaged a live weight of 484 kilograms and a yearly milk production of 3,367 kilograms with a butterfat content of 3.66 percent. General and regional herds have been established for red Danish cattle, with the same standards that have been accepted for Angeln cattle.

#### RED STEPPE CATTLE

The Red Steppe breed is the product of a complex crossbreeding process involving Angeln, grey Ukrainian Steppe, Holstein, Kholmogorsk, Simmenthal, and Wistelimarsch cattle. This breed was created in the southern Ukraine in the first half of the nineteenth century, and is now spread throughout the southern, southwestern, and southeastern parts of the USSR. Larger numbers are found in the Ukrainian steppe belt and the Azov Sea coastal area, where this breed forms 60 to 80 percent of the existing cattle inventory. In addition, it is found in northern Caucasia along the Volga and has penetrated into Siberia (Omsk) and Central Asia, as well as outside Russia: Turkey, Rumania, and Bulgaria.

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The coat color is reddish brown of various shades. Some animals have white spots at the head, udder, belly, lower part of the chest, and feet. These spots are tolerated in selection, and both the solid-colored and spotted animals are accepted for registration in the State and regional herdbooks. The skin is thin, elastic, and loose-fitting. The body is lean and blocky; the head is lean, noble, and well-modeled. The withers are 5 to 6 centimeters lower than the mid-section. The chest is moderately deep and narrow. The rump is long and wide. Both sloping and wedge-shaped rumps are found. The horns are light grey with dark tips. The muzzle, mucous parts, and hooves are of a darker color. The neck is long and thin, with many fine creases. The withers are pointed, the back is straight, and the mid-section is long, but narrow. The legs are lean, healthy, and well-placed. The udder is well-developed and well-shaped, with widely separated, cylindrical teats. According to the investigations of Professor Liskun, the udder is composed primarily of active glandular tissue, and the connective tissue is less developed. The live weight of adult cows averages 400 to 450 kilograms, that of registered bulls 600 to 650 kilograms. The height at the withers averages 124 centimeters. In the Ukraine, the average yearly milk production of the cows of the better herds is 2,900 kilograms with a butterfat content of 3.5 to 3.8 percent. The cows accepted for registration in the State Herdbook (GPK) from the Collective farms have an average yearly milk production of 2,811 kilograms, those

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from the State farms 3,244 kilograms.

Figure 15. Ukrainian red Steppe cow

During 1940, the State Breeding farms had 147 red Steppe cows with an average yearly milk production of 6 to 7,000 kilograms, and 59 cows with a production of over 7,000 kilograms.

The highest milk production was exhibited by the cow Nyurochka on the Akkerman State Farm; throughout one lactation period in 1935 she gave 10,440 kilograms with a butterfat content of 3.19 percent.

The cow Mariya in 1929, during her fifth lactation, produced 10,136 kilograms with a butterfat content of 3.47 percent and a maximum daily production of 61.5 kilograms. The record-holding cow Golubka of the Oktyabrskaya Revolyutstya State Farm gave 10,208 kilograms milk with a butterfat content of 3.5 percent over a period of 300 days, her fourth lactation.

The red Steppe is a dairy breed. It has the prerequisites for high milk production, and with improved care and feeding soon increases its output.

At the Moscow Agricultural Exhibit of 1939, 773 cows were shown either by photograph or in actuality; all had an average yearly milk production of 5,850 kilograms; of these, 45 cows gave

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over 7,000 kilograms of milk, 9 over 9,000, and 3 over 10,000. The beef characteristics of red Steppe cattle are satisfactory. Before the war, red Steppe cattle constituted a single massive group of between 7 and 800,000 head. A whole system of breeding techniques is now in effect in order to improve and perfect this breed. This line is bred in its pure state, with selection, combined with excellent feeding, directed toward increased milk production and butterfat content and increased live and slaughter weights.

Of the general biological characteristics of red Steppe cattle, their good acclimatization qualities must be mentioned first, together with their moderate needs in regard to feeding and herding conditions and their great resistance to contagious diseases. Among the disadvantages of this breed are counted their low stature, small live weight, low butterfat content of the milk, and late maturation. Constitutionally, red Steppe cattle belong to the respiratory type. Thanks to its grey Ukrainian Steppe admixture and its lean constitution, it is distinguished by great adaptability, bears up well under unfavorable Steppe conditions and climatic harshness. Thanks to its excellent acclimatization qualities, red Steppe has found wide distribution in many areas of the USSR with the most varied climatic conditions.

The development of red Steppe cattle occurred during the years 1932 to 1940, when bulls of this breed were widely used for improving local cattle in the various areas. Today, the best-known

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bloodlines in use are those of the bulls Prem'er, Avans, Derksen, Borets I, Kalif, etc.

Red Steppe Cattle in Bulgaria

Before the last war, red Steppe cattle also reached Bulgaria. As is well known, the German colonists in Russia took their pedigreed cattle with them; these they crossed with the local primitive breeds of the areas where they settled down. These pedigreed cattle included Angeln as well, which served as a base for the development of red Steppe cattle. Thus, the creation of red Steppe cattle is closely linked with the settlement of German colonists in Russia. During the last war, the German colonists were evacuated from the USSR as areas were reconquered from the German armies. On their way to Germany, the German colonists passed through Bulgaria. They moved with their carts and wagons and had a large part of their livestock with them. Because of the length of their journey, part of their red Steppe cows and bulls had to be slaughtered, sold, or exchanged for local cows and oxen, as the need arose. Thus, in the villages along the path of the German colonists approximately 800 to 1,000 cows and heifer and bull calves of the red Steppe breed were left behind. An inquiry by the Ministry of Agriculture determined that Lom Okoliya now has about 300 red Steppe cows and heifers. Placed under good care and feeding, some of these cows have developed daily milk productions of between 20 and 25 kilograms. Red Steppe cattle are also known under the name of Taurian in Bulgaria. Taurian

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cows and heifers have spread to various individual farms. The Svishtov Government Hospital keeps a herd of Taurian cattle. The Silistra City Soviet had the good idea of founding a large Taurian herd and entrusted a commission of specialists with the purchase of about 100 Taurian cows and heifers. In completing the purchase, the commission unfortunately committed a grave error which ultimately doomed the entire herd to destruction. The cows were purchased without a preliminary examination for tuberculosis and Bang's disease (brucellosis). Infected cows were acquired together with the healthy ones, in consequence of which the entire herd contracted the contagion. Because of mass abortions and positive reactions to tuberculosis tests, the City Soviet was forced to disband the herd. If the cows had first been tested for tuberculosis and Bang's disease, and the City Soviet had purchased only healthy animals, this sad result would not have occurred, and this valuable breeding stock would not have been weakened. Within the immediate future, all red Steppe cows will have to be sought out and tested for tuberculosis and infections abortion, and all diseased animals will have to be destroyed. It would be good to buy up all healthy animals and assemble them at some of the State and Cooperative farms. These herds could be turned into breeding centers to supply cows and bulls to the area of the red Stepped cattle and the villages in the dairy supply belts around the large urban consumption centers.

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**RESTRICTED****WHITE-HEADED COLONISTS' CATTLE**

The breeding area of these cattle is the northwestern part of the Ukraine. The history of its origin and development is identical with that of red Steppe cattle. White-headed colonists' is the result of crossing local cattle with Groningen and Holstein. Some authors admit the participation of other breeds in the development of this one. In its outward appearance, the white-headed colonists' breed is very similar to red Steppe cattle, with the difference that it is somewhat slighter and is of lower live weight. White-headed colonists' has black or red coat of various shades. The head is white, and in some animals so are the feet and tail. The average live weight of adult cows is 380 to 400 kilograms, of bulls 450 to 500 kilograms. The average yearly milk production is about 2,500 kilograms, while individual herds raised on Collective farms under better conditions of care and feeding have average yearly milk productions of 3,000 to 3,500 kilograms. The record for this breed is held by the cow Orbita — in her seventh lactation she gave 12,339 kilograms of milk with 3.4 percent butterfat content. Systematic selection is used to improve and perfect this breed. State (GPK) and regional (RPK) herdbooks exist, and a number of Breeding farms have been organized, as well as State Breeding centers and Collective Commodity farms. The breeding objective is to produce sturdier animals with higher milk production and increased butterfat content of the milk.

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**RESTRICTED****RED GORBATOV CATTLE**

This breed bears the name of the town of Gorbatov. It is found in the Gorbatov and Ivanovo oblasts and in the regions along the course of the Oka and partly along the Volga River, etc. This breed was developed in the first half of the nineteenth century from a crossing of local cattle with Tyrclean.

The resulting group of "Tyrolized" local cattle corresponded perfectly to the small-farm economy and growing capitalism of that time. The coat color is red or reddish brown. The muzzle is pink and the tip of the tail invariably white. The head is beautiful, short and wide. The profile is straight. The udder is medium-sized and hairy. This breed has an average height of 114 to 116 centimeters at the withers. Adult cows average live weights of 320 to 340 kilograms, bulls of 330 to 410 kilograms. The yearly milk production averages 1,600 to 2,000 kilograms with 4.2 to 4.5 percent butterfat content.

In the Central Pedigree Register of cows and bulls, 12 red Gorbatov cows are recorded as having yearly milk productions of 2,808 to 5,837 kilograms and butterfat content of 3.49 to 5.71 percent. Excellent results were produced by the Stakhanovite milkers on many Collective and State farms. For instance, on the Selyanin Collective Farm in Bogorodskiy Rayon, the milker Milova obtained an average of 4,000 liters from each of 8 cows. One of the 8 cows under her care gave, over a lactation period of 300

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days during 1936-37, 5,626 liters of milk with 4.6 percent butterfat content.

At the Moscow Agricultural Exhibit in 1939, 16 cows were shown that over 300 days of lactation had given an average of 5,063 liters of milk each. The record-breaking cow Nochka of the Flamy Revolyutsii Collective Farm, Ivanovo Oblast, over 300 days gave 7,714 kilograms of milk with 4.34 percent butterfat content, and the cow Roza of the Iskra Collective Farm gave 8,008 kilograms with 4.37 percent butterfat content.

Red Gorbatov is distinguished by excellent acclimatization qualities and resistance to disease; it responds readily to improved care and feeding. The disadvantages of this breed are its low live weight, small milk production, and late maturity. Cows achieve their full development at the age of 6 to 7 years. Improvement of Gorbatov cattle is attempted in two directions: by raising in a pure state and by improved care and feeding on the one hand, by systematic selection and crossing with dairy short-horn on the other. Up to 1 April 1937, 8,820 cows and 848 bulls of the Gorbatov breed were registered in the Regional Herdbook, and 1,406 cows and 283 bulls in the State Herdbook (GPK).

**SIBERIAN CATTLE**

Siberian cattle belong to the dairy breeds. Its breeding area includes the immense territory of Siberia. The coat of this

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animal is of highly varied colors, though red predominates. The harsh climatic conditions of proverbially frigid Siberia have developed Siberian cattle into a very resistant and enduring breed. Thanks to these qualities, Siberian cattle can spend the long fierce winter with its snowstorms out of doors. In very strong and cold gales, cattle can find shelter under primitive windbreaks that hardly give them good protection from the wind. But nature has given Siberian cattle good winter protection by means of a thick coat of hair.

Siberian cattle are very poorly fed. During the winter, they are given only hay, quite often of poor quality. During the summer, they find their own food on the rich pastures through the short pasturage period ( $2\frac{1}{2}$  to  $3\frac{1}{2}$  months). Adult cows average live weights of 250 to 300 kilograms, bulls of 350 to 400 kilograms. The meat and milk production of Siberian cattle is low. The average yearly milk production varies from 1,300 to 1,400 kilograms, with a butterfat content of 4 to 5 percent. Under improved conditions of care and feeding, Siberian cattle considerably increase their live weight and milk productivity.

The Stakhanovite livestock-raisers of Omsk and Novosibirsk oblasts have obtained as much as 2,500 to 3,200 liters of milk from many cows. Siberian, like red Gorbato cattle, is being improved in two directions: (1) pure breeding and selection, and (2) crossbreeding. It is now principally crossed with Tagil and Simmenthal cattle, and in some areas with red Steppe, Frisian,

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and shorthorn. The results of these crossings will give help to specialists in deciding which of the named breeds should be used for improvement. The Collective and State farms are now building windbreaks, stables, and better foraging facilities -- all of which should help greatly in the work of improving the breed. Under improved conditions of care and feeding, this breed will undoubtedly increase its milk productivity and live weight. Great hopes are now placed on this breed for the increase of butter production, not merely to cover the domestic needs of the USSR, but also eventually for export.

**KOSTROM CATTLE**

These cattle were obtained in the oblast of the same name in the USSR by a crossing of local cattle with Allgau and Swiss.

The origin of Kostrom cattle belongs in the second half of the nineteenth century. The center for crossbreeding was the estate of the Nikolay Babayev Monastery, which imported pure Allgau and Swiss bulls. The animals resulting from the cross excelled by high milk productivity, a trait which they handed down to their progeny. Later crossing, mating, and selection have been carried out under the direction of the Kostrom State Breeding Center. Among the Collective farms of the Kostrom Oblast, the best results were obtained by the Karavayev Breeding Farm, in which Senior Animal Husbandman and Deputy of the Supreme Soviet S. I. Shcheyman was working.

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According to reports by Shcheyman, the foundations for the Karavayevo herd were laid by the Swiss and Allgau crossbreeds coming from the estate of the Nikolay Babayev Monastery and purchased from the selection available on the market. Thanks to good care and feeding, systematic and methodical improvement of the breed, and Shcheyman's method of bringing up calves, the Karavayevo herd has in a relatively short time achieved qualitative and quantitative results unheard of in the history of raising dairy cattle. The average yearly milk production of the Karavayevo herd over the years has been as follows: 1940 -- 6,310 liters (238 cows), 1941 -- 5,606 liters (244 cows), 1942 -- 5,373 liters (229 cows), 1943 -- 5,449 liters (264 cows). From among this herd, 60 cows have achieved records of over 8,000 liters and 10 of over 10,000 liters. Among record-holding cows are Poslushnitsa II, which over 300 lactation days has given 16,263 kilograms of milk with a butterfat content of 3.92 percent, and Orlitsa who has given 12,849 kilograms of milk with 3.77 percent butterfat content. The cow Skhema has given 10,534 kilograms with 4.6 percent butterfat content, i.e., 484.56 kilograms of butter. Over the winter, the calves on the Karavayevo State Farm and the Breeding farms of Kostrom Oblast are kept in special stalls and barns which, despite the fierce Russian winter, are left unheated. The calves are thus raised under rather harsh conditions in accordance with the method of Stalin Prize Winner Senior Animal Husbandman S. I. Shcheyman. Under these conditions of care and feeding, calves become hardy and resistant to disease, unspoiled as to care and feed-

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ing, and when mature they show high productivity. The record-holding cows Vol'shebnitsa, Slyuda, Vaida, and Liniya give over 7,000 kilograms of milk a year and are kept under this sort of harsh regime.

Of decisive importance in the raising of highly-productive animals is the favorable intrauterin development of the foetus, and grain feeding of the calves right after calving. The rich experience of the Collective farms of the USSR teaches us that calves from very good parents, but raised under poor conditions, cannot, even with grain feeding, develop high productivity as adult animals. Good feeding conditions do not mean the fattening of calves by exclusive grain feeding. That is equally erroneous. The calves in Kostrom Oblast have an average daily gain of 800 to 900 grams.

On the Karayevo State Farm, bull calves up to 12 months of age have an average daily gain of 949 to 996 grams, and heifers of 840 to 886 grams. On the Pyatiletka Collective Farm, calves have an average daily gain of 850 to 900 grams.

These unusually high figures for the daily gain of calves achieved by the Karavayevo State Farm and the Pyatiletka Collective Farm are a result of the great love of the workers for the animals, their grain feeding, and the individual care for each animal. A result of socialist achievement, this highly-productive line, by the decree of the National Commissariat of Agriculture (now Ministry of Agriculture), of 27 November 1944, was recognized

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as an individual breed under the name of Kostrom.

Figure 16. Kostrom cow

The improvement and perfection of the Kostrom breed is now in the hands of the Kostrom Breeding Center and the Karavayev State Breeding Farm.

Many Kostrom cows and bulls are accepted for registration in the Regional Herdbook. The average yearly milk production of cows on the best Collective farms varies from 3,500 to 4,500 kilograms. The calves average live weights of 30 to 34 kilograms at birth, and at 6 months heifers reach 163 kilograms and bull calves reach 181 kilograms. Since 1945, the Kostrom breed has been used for the improvement of dairy cattle in Kostrom Oblast and various rayons of the Yaroslavl, Ivanovo, and Vladimirov oblasts and the Tatar ASSR.

#### SIMMENTHAL CATTLE IN THE USSR

The first import of Simmenthal cows and bulls into Russia from Switzerland was effected as early as the beginning of the nineteenth century. The largest number of Simmenthals were imported during the second half of the past century. During that period of the development of capitalism, the large estates of the landholders with their primitive stock-raising methods fell into a difficult

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position and had to be reorganized by replacing their local, poorly-productive, and uneconomical breeds of cattle with improved and more productive breeds. The imported Simmenthal cattle served for a mass cross-fertilization of the local cattle on the landholders' estates. Thanks to its great adaptability and all-around productivity, Simmenthal was widely accepted. Thus, the breed formed 3 percent of the inventory at the All-Russian Exhibit of 1877-79, but 33 percent at that of 1914.

After the October Revolution, during the Civil War and Intervention periods, the breeding of Simmenthal cattle suffered heavy reduction. A large number of priceless Simmenthal cows and bulls perished despite the decisive steps taken by the Government and by the All-Russian Communist Party of Bolsheviks for the safeguarding of breeding animals.

According to statistics of the stock-raising section of the People's Commissariat for Agriculture, 27 breeding farms acquired 12,971 breeding animals over the years 1925-26, of which 2,339 were Simmenthal cows and bulls. Over the one ten-year period of 1919-29, 1,200 Simmenthal cows and bulls were imported into the Soviet Union from Western Europe for the formation of 11 State Breeding centers and 13 State Breeding farms. Now, dozens of State and Collective farms and hundreds of Stakhanovite milkers can be found who have achieved very high results with Simmenthals. Thus, the Vpered K. Sotsializmu Collective Farm in Sychev Rayon, Smolensk Oblast, during 1937 obtained an average

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of 4,555 kilograms of milk per herd cow. The Proletarskaya Revolyutsiya Collective Farm in Poltava Oblast during 1937 obtained an average of 3,574 kilograms milk per herd cow.

Deputy of the Supreme Soviet Ekaterina Dimitrovna Nartova in 1937 obtained an average of 5,887 kilogram per herd cow from the Simmenthal crossbreeds under her care. On the Telman Collective Farm, Chernigov Oblast, six Simmenthal crossbreed cows gave an average of 5,335 kilograms. On the Rudyansk State Beet Farm, Kiev Oblast, Simmenthal cows in 1938 gave an average of 5,853 kilograms. On the Breeding farms of the People's Ministry of Agriculture and the Glavsokhar, 47 cows in 1940 gave an average of 6 to 7,000 kilograms of milk.

At the 1939-40 Moscow Agricultural Exhibit, 1,800 pure and crossbred Simmenthal cows were shown in actuality and by pictures; on the average these had produced, during their first lactation, 4,190 kilograms, during their second lactation 5,053 kilograms, and during their third lactation 5,530 kilograms of milk.

A large number of record-holding cows are found among pure and crossbred Simmenthals. Data on some of them are presented in the table below. (following page)

The number of record-holding cows should also include Milka, a Simmenthal second-generation crossbreed on the Lenin Collective Farm of Volochanskiy Rayon, Kharkov Oblast. In her ninth lactation this animal gave 8,307 kilograms of milk with a butterfat

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content of 5.7 percent, i.e., 409.3 kilograms of butter.

Name of cow	Lactation number	Milk production (in kg)	Butterfat percentage
Gagara	7	10,932	3.10
Rezeda	3	10,233	3.10
Anta	3	10,061	3.70
Ptichka	4	9,595	4.03
Moyka	9	8,449	3.60
Mara	3	8,307	3.36
Manya	5	8,053	3.60
Ryzhka	9	9,881	---
Tsenna	8	9,368	---

In terms of butter production, Milka is in third place in the world, after the cows Dama and Kastanie.

Up to the Great October Revolution, the breeding of Simmenthal cows was conducted in a rule-of-thumb, haphazard manner. After the Revolution, a series of regulations by Party and Government brought systematic planning into the breeding of Simmenthal cattle.

Under the influence of the Simmenthal breed, the nature of local cattle is being basically changed in Smolensk Oblast, and especially in the Sychevskiy, Vyazemskiy, and other rayons where, since the end of the nineteenth and beginning of the twentieth

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century, more or less systematic crossbreeding has been taking place. Now the Sychevskiy Rayon constitutes the center of Simmenthal breeding. The products of the consistent crossbreeding of local and Simmenthal cattle are known under the name of Sychev Simmenthals.

Between 1930 and 1938, the Sychev State Breeding Center (GPR) sold 25,174 bull and heifer calves for breeding purposes.

Up to 1 January 1938, 273,242 head were entered in the Regional Herdbook (RPK), of which 170,330 were cows. In the State Herdbook (GPK), 13,579 animals are registered, of which 8,938 are cows, 1,912 are bulls, 2,729 are bull and heifer calves. In the Central Pedigree Register 130 animals belonging to the best bloodlines are entered. Best known are the bloodlines of the bulls Franz 176, Lotus, Albert, Schach, Mal'chik, Naslednik I, Faust, Viktor, Nero, Bogatyr', Sirius, and others.

The most important roles in the development and spread of Simmenthal cattle in the USSR are now played by the State Breeding farms Trostyanets in Chernigov Oblast, Sychevskiy in Smolensk Oblast, Lenin in Voronezh Oblast, and XVIIth Party Congress in Kursk Oblast. A dense network of Breeding centers and a Central Pedigree Register are the important husbandry prerequisites for the improvement and perfection of the Sychev Simmenthal breed. The pedigreed Simmenthal cattle now produced by Smolensk Oblast completely correspond to the needs of the USSR and thereby save millions of leva in foreign currency that would otherwise have to

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to be used for the import of Simmenthals from abroad.

Simmenthal cattle are found in Smolensk, Tambov, Ryazan, Orlov, Kursk, Veronezh, Chkalov, Kuybyshev, Sverdlovsk, Chelyabinsk, and Novosibirsk oblasts, and in a number of rayons of other oblasts.

#### SIMMENTHAL CATTLE IN BULGARIA

The first import of 4 cows and a bull of Simmenthal breed into our country occurred in 1896, from the Hungarian horse-breeding farm Babolna. The second import of 4 Simmenthal cows and one bull took place in 1903 from Russia, and the third import of 9 cows and one bull in 1907. The imported Simmenthal cows and bulls have been placed under the care of a model farm and their offspring are transferred from there to the V. Kolarov (Kabiuk) Enterprise and other State farms. The first attempts at acclimating Simmenthals ended unfavorably. Large numbers of the Simmenthal cows and bulls and their offspring placed under the care of State farms contracted tuberculosis, tick fever (piroplasmosis), and other diseases, and the herds had to be dissolved. The sad results of the first attempts to acclimate Simmenthals in Bulgaria were an unavoidable consequence of the unfortunate selection of breeding area, incorrect care, and poor feeding.

On the State farms which then still were in their period of inception and organization, Simmenthal were kept in dark, air-

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less, and unsanitary stables, and were given scanty and improper feeding and very poor care. As a consequence, the infection of large numbers with tuberculosis, tick fever (piroplasmosis) and other diseases and a radical decrease in their productivity and fertility were inevitable. The fact that on the Collective farms of the USSR the original Simmenthal cows and bulls and their progeny, under better conditions of care and feeding, become acclimated rapidly and easily and maintain their fertility, and the cows have greater milk production than in their native Switzerland, as well as the fact that they are being successfully raised in neighboring Rumania, Yugoslavia, Hungary, Czechoslovakia and other countries, presents indisputable proof of the good acclimation qualities of the Simmenthal breed.

The experiences of the Soviet Union, Hungary, Yugoslavia, Germany, and other countries shows us that the Simmenthal breed could successfully be raised in Bulgaria as well, provided the cattle are placed under a regime of better and more regular care and feeding. In the State and Cooperative farms with better feeding facilities, herds of purebred Simmenthals can be founded which can serve as breeders of bulls for the needs of northwestern Bulgaria, where large-scale crossbreeding with local cattle is to be accomplished.

Figure 23. Simmenthal crossbreed bull, height at the withers, 165 cm; live weight, 1,050 kg

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In Vidin, Kula, and partially Belogradchitsa okoliyas, Simmenthal were imported principally from Serbia during 1905-07, at the initiative of the local population. During 1918, retreating Bulgarian troops brought a considerable number of Simmenthal cows and bulls with them as trophies. A considerable number of Simmenthal cattle were imported by people of dual allegiance. By way of contraband, farmers in Kula Okoliya obtained Simmenthals and Simmenthal crossbreeds from Zajecar Okoliya, farmers in Vidin Okoliya from Negotin Okoliya. In the same manner, many Simmenthals and Simmenthal crossbreeds entered Belogradchitsa Okoliya from Pirot Okoliya.

The breeding cattle brought in from Yugoslavia were not purebred, but consisted of a mixture of several breeds in which Simmenthal predominated. Purebred Simmenthals were very rare. The uncontrolled crossbreeding of local cattle with Simmenthals and Simmenthal crossbreeds has produced today's local improved cattle in northwestern Bulgaria. This cattle breed has uniform roan coats of various shades and is distinguished by greater sturdiness, having live weight and milk productivity higher than the local cattle.

In line with the decisions of the Supreme Livestock Raising Soviet adopted in April 1947 in regard to the large-scale crossbreeding of local cattle with Simmenthal on the Cooperative Farms, Simmenthal bulls and cows are imported into northern Bulgaria almost every year. During 1947, 46 Simmenthal cows and 13

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bulls were imported from Yugoslavia. Some of these animals are highly pedigreed Simmenthal crossbreeds. During 1948, 9 pure Simmenthal bulls and 9 cows were imported from Switzerland, and during 1949, 33 Simmenthal bulls and 10 heifers.

In addition to local cattle, Simmenthals are crossbred, although less frequently, with Pinzgau, brown Swiss, and red Sadovo cattle, or with several breeds at once. The resulting crossbreeds of this complex process have a typical coat color.

Figure 24. Simmenthal crossbreed heifer

In order to evaluate the cumulative results of the crossing of local cattle with Simmenthal in northwestern Bulgaria, a program which has been carried on for over 40 years, the Ministry of Agriculture organized 3 livestock exhibitions during the fall of 1947. The Simmenthal crossbreed cows of 3 years and over shown at the exhibitions had an average height at the withers of 134.9 centimeters and an average girth at the windpipe of 18.2 centimeters. If we compare the average figures for the external features of the Simmenthal crossbreeds with those established for the local grey cows in the breeding area by Professor Platikanov, a considerable difference in favor of the former can be noted. For instance, the average height at the withers of the local grey cows is 118.7 centimeters, of Simmenthal crossbreeds 134.9 centimeters, which is a difference of 16.2 centimeters in favor of the

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latter, etc.

Simmenthal crossbreeds have an average yearly milk production of about 2,000 to 2,500 kilograms, with variations from 1,500 to 5,000 kilograms, and a maximum daily milk production of 25 to 30 kilograms with 4 percent butterfat content. Adult cows have an average live weight of 5 to 6,00 kilograms with variations between 450 and 750 kilograms, and bulls average 800 to 1,000 kilograms. Well-fattened steers reach weights of up to 1,200 kilograms.

Simmenthal crossbreeds fatten well, and the flesh is interlarded with fatty tissue, making the meat juicy, tender, and tasty. Simmenthal crossbreeds also have a good capacity for work. In northwestern Bulgaria, cows are, in addition to their milk and offspring, almost without exception used for work as well. Simmenthal crossbreed oxen are sturdy, with healthy bone structure and great capacity for work. In our study of Simmenthal crossbreeds in northwestern Bulgaria, we measured oxen heights at the withers up to 165 centimeters, trunk length up to 208 centimeters, girth at the heart up to 225 centimeters, and girth at the windpipe up to 25 centimeters. Such oxen can easily pull loads up to 2,000 to 2,500 kilograms.

In the latest regional apportionment of cattle breeds in the country (1947), the Supreme Livestock Raising Soviet designated the following okoliyas as breeding areas for Simmenthal cattle: Vidin, Kula, Belogradchik, Mikhaylovgrad, and Lom, with Vidin as the center of the area.

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In addition, the Supreme Soviet determined the distribution area of Simmenthal cattle to be all of northern Bulgaria, as well as the Cooperative farms and all villages included in the milk supply belts around the large urban consumption centers.

According to the latest census of domestic animals according to breed carried out by the Office of Statistics on the initiative of the BAN, the number of Simmenthal and Simmenthal crossbreed cattle comes up to 3.46 percent of the total number of cattle in the country.

#### BROWN SWISS CATTLE IN THE USSR

These cattle were first imported into Russia at nearly the same time as Simmenthal in the beginning of the nineteenth century. The economic conditions which prompted the import of Holstein, Simmenthal, and shorthorn cattle contributed also to the import of brown Swiss cattle into Russia.

The imported cows and bulls of this breed were raised and bred on the large estates of the landholders. The brown Swiss bulls produced were also used to crossbreed with primitive native cattle. In areas where crossbreeding was carried out, centers of local improved cattle, distinguished by higher productivity, arose. Crossbreeding has also led to the development of one of the most dairy-rich breeds, namely, the Kostrom cattle. Crossbreeding with brown Swiss cattle has been carried out in Smolensk

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and Tula oblasts, in the Ukraine, and in other areas. After the October Revolution, large-scale crossbreeding with brown Swiss cattle was begun. During the last two decades, a considerable number of brown Swiss breeding animals have been imported to be used for large-scale crossbreeding on Collective and State farms with local cattle.

Figure 26. Brown Swiss (Montafone) bull

The results of the appraisal of crossbred and purebred animals of the brown Swiss breed for 1940 on the State Breeding farms are given in the table below.

Bloodline	Number of animals appraised		Average live weight in kg		Average milk production	
	1st lactation	2nd lactation	1st	2nd	1st	2nd
			lactation	lactation	lactation	lactation
Purebred animals	367	316	553	684	3,464	5,074
Fourth generation	126	132	535	583	4,012	5,044
Third generation	264	211	480	544	2,905	4,902
Second generation	397	511	465	501	2,254	3,526
First generation	164	700	440	491	2,324	3,673

The above data show that the figures for live weight and milk productivity of purebred animals and crossbreeds of the third and later generations are rather high. The lowest average figures for live weight and milk productivity are for the cross-

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bred cows of the first generation. As the generations progress, the figures gradually go up, so that crossbreeds of the fourth generation almost equal purebreds in regard to live weight and milk productivity.

The State Breeding farms during 1940 had 169 cows with a yearly milk productivity of 6-7,000 kilograms and 135 cows with a yearly milk productivity of 7,000 kilograms.

At the Moscow Agricultural Exhibit only 37 percent of the brown Swiss cows had a yearly milk productivity of below 5,000 kilograms; 33 percent of the cows had a milk productivity of more than 6,000 kilograms, and 19 cows (2.8 percent) more than 9,000 kilograms. In their record yearly milk production and maximum daily yield, brown Swiss cows in the USSR exceed those in Switzerland. Thus, the record milk production per lactation period of 9,653 kilograms was achieved by the cow Maggi, and the Soviet record is 12,623 kilograms. The cow Zina on the 88th day of her sixth lactation developed a maximum daily milk production of 67.2 kilograms with 4 percent butterfat content, and the cow Vina on the Stalin Collective Farm, Lebedin State Breeding Center (GPR), on the 59th day of her fourth lactation gave a maximum day's yield of 69.5 kilograms. The cow Lenta of the same collective farm 37 days after calving gave a maximum daily yield of 64.75 kilograms.

For the breeding of the valuable brown Swiss cattle many breeding centers have been established, the most important of

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which are in Smolensk, Lebedin (Kharkov Oblast), Laptev, Alma Ata (Kazakh SSR), Kirghiz, Stepanovsk (Armenian SSR), Laptev, Alma Ata (Kazakh SSR), Kirghiz, Stepanovsk (Armenian SSR), etc. Parallel to these, many State Breeding farms have likewise been established in the different oblasts and rayons of the USSR, serving to produce valuable breeding cattle of the brown Swiss breed.

The fundamental task in the improvement of this breed is the maintenance and increase of live weight, milk productivity and butterfat content, accelerated maturity, and the maintenance and improvement of its local characteristics by means of pure breeding and selection.

The sires of the most notable bloodlines are the bulls Dodona, Primus, Franz, Levko, etc.

**BROWN SWISS (MONTAFONE) CATTLE IN BULGARIA**

From liberation until today, 17 imports of brown Swiss cattle, known in our country as Montafone, have taken place. The 740 Montafone cows and bulls which have been imported so far come from various breeding areas -- Tyrol, Vorarlberg, Montafone, Switzerland, and Bregnezwald. This relatively large number of genuine purebred animals, thanks to unsystematic distribution, poor care and feeding, and the want of permanent measures for insuring the improvement of breeding conditions has been lost to a large extent.

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Had the breeding and distribution areas for Montafone cattle been selected more carefully and better conditions provided for their care and feeding, the results would have been incomparably better. Despite the random, unsystematic nature of the crossings of local cattle with brown Swiss, the character of livestock raising in the dairy supply belt around greater Sofia and other great urban consumption centers has been radically changed. One glance at the cattle on the dairy farms in the Sofia, Stara Zagora, Burgas, and other areas is enough to convince us that Montafone cattle has had an enormous influence on livestock-raising on these farms. Many of these farms own purebred Montafone cows or Montafone crossbreeds of the third and fourth generation that do not differ from the purebred animals by color of coat, sturdiness, body shape, or productivity. Thus, the newly-formed cow herd of the Ministry of the Interior in the village of Kazichane includes Montafone crossbreeds that give up to 26 kilograms of milk daily, and in the village of Dolna Banya, Ikhtiman area, the cow Tsveta has developed a maximum daily milk production approaching 37 kilograms. The studies of Doctor Zdravko Gunchev show the average milk production per lactation period of 191 cows imported from Vorarlberg to be 4,048.8 kilograms, with fluctuations from 1,478 to 11,550 kilograms, and that of 105 cows imported from Switzerland to be 3,762.8 kilograms, with variations from 1,045 to 7,580 kilograms. The milk productivity of the progeny of the original cows averages (for 223 animals) 4,006.7 kilograms.

Purebred Montafone herds now exist on the livestock farm

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near the town of Samokov, the livestock depot near the town of Koprovshtitsa, and the farm of the School of Animal Husbandry.

On the livestock farm near Samokov, the cattle-raising section was founded in 1926. The inventory of Montafone cattle before the war (1936) consisted of 82 head. Over a period of 9 years, the cow herd on the Samokov farm achieved an average yearly milk production of 4,066 kilograms, with a butterfat content of 3.46 percent. Over the same time period, the milch cows averaged a live weight of 556 kilograms.

The cattle-raising section near the town of Koprivshitsa was established during 1942.

During the last 2 to 3 years, in many of the cooperative farms throughout the country well-developed herds of Montafone and Montafone crossbreeds have been formed. Examples are the herd at the Cooperative Farm of the village of Stalina, Lovech Okoliya, and of the village of Ludzhene, Pirdop Okoliya. These two herds likewise contain cows which give up to 25 to 30 kilograms of milk a day. During April 1947, the Supreme Livestock Raising Soviet defined the distribution area of brown Swiss cattle to include Sofia, Breznitsa, Samokov, Godech, Trun, Novo Selo, Pirdop, and Panagyurishte okolias, and Klisurskiya Manastire (Berkovitsa Okoliya), with Sofia the center of the area.

The distribution area for brown Swiss cattle is to include also the Cooperative farms in all of southern Bulgaria and the

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villages included in the dairy supply belts around the urban consumption centers.

According to the latest census of domestic animals by breed, conducted by the Office of Statistics in 1949, the inventory of Montafone and Montafone crossbreeds constitutes 2.49 percent of the total number of cattle in the country.

#### LOCAL GREY CATTLE

Grey Bulgarian cattle is an indigenous local breed. It is numerically best represented of all the breeds of cattle found in our country. Typical local grey cattle in vast numbers are found along the Iskur, Vit, Osum, Skuta, and Rositsa rivers. In addition, this breed is represented in other regions and areas of our country, just as in some places it is more or less blended into the improved breeds imported from abroad. The best cattle in the Vit River valley are found in the villages of Dermantsi, Bezhanovo, Beglezh, Sadovets, and Toros. In the Iskur River valley, the breed is found in the towns and villages of Makhalata, Oryakhovitsa, Bregare, Stavertsi, Knezha, Turnak, and Byala Slatina; in the Rositsa River valley it is found in the villages of Damyanovo, Berievo, Rekhovtsite; in addition, very good and typical cattle of the local breed is kept by the villages of Vrabevo and Debnevo in the Troyan area, and the villages of Peternitsa and Burkach in the Pleven area.

Grey Bulgarian cattle belong to the species *Bos taurus*

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primigenius. It belongs to the group of dual purpose breeds. Systematic improvement of local grey cattle has been in progress since 1915. That was when the first livestock raising societies were founded. In 1930, the Livestock Breeders' Association was founded, which united 200 livestock-raising societies with 10,000 members.

Figure 27: Group of Montafone crossbreed cows,  
winners of first prize at the 1946  
National Exhibit at Pleven

The Association, under the leadership and with the material help of the Ministry of Agriculture, organizes spring livestock shows and exhibits, cow and bull markets, checks the productivity of cows, etc. 400 to 500 bulls are sold yearly on the markets of the Association to fill the needs of the communities of the entire country for the servicing of cows on individual farms.

Description

The coat color is grey of various shades. Some animals of a pleasant greenish-grey color are also found, which the farmers prize highly and prefer. Some animals have very light, almost white (cotton-colored) hair. The coat of the bulls is somewhat darker. Usually, their forequarters are of a darker color. Some of the bulls have dark rings around the eyes. The tips of

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the horns, the muzzle, mucous parts, brush of the tail, hooves, eyelids, and the lower part of the scrotum of the bulls are black. The head is medium-sized and beautiful. The milch cows have lean, noble, and well-modeled heads. The horns are white at the base and in both cows and oxen have a beautiful lyre-shaped form. Animals whose horns are shaped like clamps, half-moons, or forks, etc are found less often. The bulls have shorter, thickset horns pointed toward the side. The neck is medium-sized, muscular, and has a large, beautiful dewlap. The back is straight, but animals with slightly concave, and — less often — convex back are also found. The rump is usually narrow, pointed, and sloping. This is one of the racial defects of the local grey breed. Though less often, animals with wide and straight rumps are found as well. By selection and better feeding of the young animals, this racial defect of local grey cattle can be corrected. The legs are lean,

Figure 28. Typical cow of the local grey breed

healthy, and well placed, but animals with camel-like and knock-kneed stance are also found. The dairy characteristics of most animals are not very prominent, but in the more productive animals the udder is well-developed and shaped. Like the udder, so the teats have varying shape and size. The measurements made by Professor N. Platikanov on 1,039 cows in the breeding area give the following averages: height at the withers 118.9 centimeters,

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with variations from 108 to 131 centimeters; length of trunk 137.1 centimeters, i.e., 115 to 115.9 percent of the height at the withers; girth at heart 163.13 centimeters; girth at windpipe 15.74 centimeters. On the Vasil Kolarov Enterprise the average height at the withers of the herd of local grey cows is 124 centimeters. The live weight of adult village cows averages 320 to 350 kilograms, of bulls 500 to 600 kilograms. Calves at birth average a live weight of 21 to 22 kilograms. A characteristic of the local grey breed is that calves are born with a red coat which gradually changes to grey.

The local grey breed is still quite unbalanced as to type, size, body shape, coat color, and milk productivity. The latter varies within very wide bounds. The average milk productivity per lactation period of cows in the breeding area is 1,200 to 1,300 kilograms, and that of controlled cows is 1,800 to 2,000 kilograms, with a butterfat content of 4.1 to 4.2 percent. The cows in the herds of the livestock raising enterprises have an average milk productivity of 2,400 to 2,500 kilograms per lactation period. Under village conditions, some cows give 4,000 to 5,000 kilograms of milk. For instance, the cow Krayna 42 of the village of Toros, Lukovit county, developed a milk production of 5,774 kilograms throughout the year 1939. The cow Milka belonging to Todor Nikolov of the village of Stavertsi, Oryakhovitsa Okoliya, in the control year 1946-47 during 335 days of lactation gave 6,269 liters of milk with a butterfat content of 4.6 percent, i.e., 288.3 kilograms of butter. This production of milk

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and pure butter constitutes a record for grey Bulgarian cattle. On the Vasil Kolarov Enterprise, the cow Nagrada gave 6,168 kilograms of milk, throughout one lactation period, and the cow Orbita gave 5,900 kilograms. On the Georgi Dimitrov Enterprise near the town of Pleven the breed cows Neda, Kuna, Drama, and Perka have proved to be the most productive.

Figure 29. Local grey bull

On the Georgi Dimitrov Enterprise near the town of Pleven, the cow Nedelya, who achieved an age of 19 years, gave during her lifetime a total of 42,863 kilograms of milk with a butterfat content of 4.5 percent, i.e., 1,914 kilograms of pure butter. The cow Nadya, Nedelya's offspring, by her 8th year had given 32,210 kilograms of milk with a butterfat content of 4.75 percent, i.e., 1,425 kilograms of pure butter. Nanka I by her 8th year had given 21,041 kilograms of milk with a butterfat content of 4.5 percent, i.e., 937 kilograms of butter, etc.

These high daily and yearly productions are an indication of the fact that grey Bulgarian cattle is capable of achieving medium milk productivity. Considering the small live weight, high butterfat content of the milk, and the hitherto scanty feeding under conditions of small farming, the milk productivity of grey Bulgarian cattle may be considered satisfactory.

By systematic mating and selection and better care and feed-

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ing, the live weight and milk productivity of local grey cattle can be raised considerably. Their fattening qualities are good. Well-fattened steers achieve live weights of 800 to 900 kilograms. The meat is tasty, but is not interlarded with fatty tissue. The local cattle during fattening deposit fat under the skin and around the internal organs. For this reason, local grey cattle do not have a good market in the West European countries. Hence, local cattle in excess and destined for slaughter was exported before the war into Eastern markets: Palestine, Greece, Egypt, Malta, etc.

Local grey cattle have excellent capacity for work, fatten well, and have satisfactory milk productivity. The breed is a product of our conditions of soil and climate — it can stand abrupt temperature changes, is resistant to disease, and is not spoiled about food. On the Cooperative farms, it is to be used as a base for crossing with improved breeds such as Simmenthal, Montafone, red Sadovo, etc, and on individual farms it is the principal means of hauling power and therefore has its place.

Figure 30. The cow Milka, holder of the record for grey Bulgarian cattle, over 335 days of lactation gave 6,269 kilograms of milk with a butterfat content of 4.6 percent

Thanks to its valuable economic characteristics, grey Bul-

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garian has become known in the neighboring countries where before the war there was rather considerable interest in it. Before the war, more than 1,000 cows and bulls of the Iskur breed were exported to Greece and Turkey for breeding purposes. During 1947, 200 cows and 100 bulls of the local grey breed were exported to Yugoslavia. The Supreme Livestock Raising Soviet in 1947 assigned the following okoliyas to the breeding area of grey Bulgarian cattle: Pleven, Lovech, Sevliev, Troyan, Teteven, Lukovit, Pavlikeni, Oryakhova, Byala Slatina, and Svishtove up to the Yantra River, with Pleven as the center of the area. Excluding the breeding areas assigned to Simmenthal, Montafone, and red Sadovo cattle, the rest of the country is designated as the distribution area of local grey cattle. In the distribution area of grey Bulgarian cattle, the communities may maintain bulls of this breed to service the cows of individual farmers.

According to the latest (1949) census of domestic animals by breed, the inventory of grey Bulgarian cattle constitutes 61.18 percent of the total number of cattle in the country.

#### SHORTHORN RHODOPE CATTLE

The breeding area for this breed includes almost all the villages of the Rhodope Mountains. Shorthorn Rhodope cattle are typical representatives of the species *Bos taurus brachycerus*. According to the studies of Professor Khlebarov, this cattle is genetically closely related to Albanian, Montenegrine, and Mace-

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donian cattle of Yugoslavia, and with shorthorn Gruzinian cattle.

Shorthorn Rhodope is the oldest breed of cattle in Europe. It is dwarf cattle. Its breeding area has mountainous, broken terrain with extensive low and high mountain pastures. The area is traversed by the Mesta, Arda, Vucha, Sura, and Suyutlichay rivers.

The Rhodope mountains are well forested. In the lower altitudes, the forest is deciduous; in the higher altitudes it is coniferous: fir and pine. In comparison to Alpine pastures, Rhodopian pastures are poor. The base rock upon which the pasture is formed is of eruptive origin, because of which the botanical composition of the grass cover of the meadows and pastures is much poorer than that of the Alps. The cold soil of the Rhodope mountains produces a rather acid and low-grade grass cover. In the Alps, the base rock of the soil is limestone. Such a soil is warm and fertile and produces predominantly sweet grasses and papilionaceous plants. Alpine pasture and roughage has greater nutritive value than Rhodopian pasture and roughage.

The low altitudes along the lower course of the rivers crossing the breeding area are used for fields and meadows, and for cattle pasture are used the steeper locations which are not good for any other purpose. The small Rhodope cattle climb about these steep and poor pastures like goats.

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The climate of the breeding area is mild and moist. Average yearly precipitation, as measured in Momchilgrad, amounts to 906.5 liters per square meter. The population of the breeding area of shorthorn Rhodope cattle is for the most part very poor and has little property. The majority of the farmers own plots of about 100 to 200 ares. The most extensive plots range from 200 to 500 ares, but they number relatively few. It is only natural that under such small-farm conditions the feeding of Rhodope cattle is very scanty. During the pasture period, all types of cattle are limited to pasture only, and during the winter they receive roughage. Concentrated fodder is kept in supply very rarely.

#### Description

The head is short, narrow, and lean, and the orbital profile is concave. The horns are dark-colored, thin, brittle, and unstably placed on the head, hence they often fall off. Animals with broken horns are therefore often found, and some animals are polled altogether and show the horn bases only. The color of the coat is most varied: red, blackish brown, grey-grown, yellow, yellowish grey, and more rarely grey. With the predominant blackish brown color appears also a light ring around the snout and a light stripe along the back. The mucous parts around the eyes, vulva, and anus are black or lead grey. The skin is medium thick, but soft and loose, and forms many fine creases at the neck. The body is of medium length and compact. The legs are healthy, but animals with camel-like and knock-kneed stance occur as well. The

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average height at the withers of adult animals in the breeding area is 97 centimeters. The live weight of cows in the breeding area varies within wide limits from 80 to 180 kilograms, that of bulls from 180 to 250 kilograms. Cows placed under better conditions of care and feeding may achieve live weights of 200 to 250 kilograms, and bulls of 300 to 500 kilograms. On the farm of the Department of Animal Husbandry, Rhodope cows have an average live weight of 258.6 kilograms, with variations from 200 to 300 kilograms, and the bull Tunis has a live weight of 450 kilograms. The heavier live weight of the Rhodope cows and bull at the Department of Animal Husbandry Farm in comparison to the animals of the breeding area is explained by their better care and feeding.

The live weight of calves at birth is 8 to 12 kilograms, and less frequently 15 kilograms. On the Department of Animal Husbandry Farm, Rhodope calves have an average live weight at birth of 15.85 kilograms, with a minimum of 13 kilograms and a maximum of 18 kilograms.

Rhodope has good milk productivity in terms of its live weight. It is true that their absolute milk productivity is low, but their relative milk productivity is high. Cows in the breeding area on the average give 3 to 4 kilograms milk a day, more rarely 5 to 6 kilograms. Rhodope cows placed under better conditions of care and feeding on the State farms give 6 to 10 kilograms of milk a day, i.e., they double their production. The maximum daily milk production of 12 kilograms was developed by

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one of the cows at the cattle depot near the town of Smolen. This year, the cow Zhilka on the Department of Animal Husbandry Farm developed a maximum daily milk production of 12.5 kilograms and maintained her record. The average yearly milk production in the breeding area is 500 to 600 kilograms. The average yearly milk production of 5 cows of the Smolen cow herd was 932 liters with 4.6 to 5 percent butterfat content. The record yearly milk production of 1,171 kilograms with a butterfat content of 4.08 percent was shown by the cow Lora.

Figure 31: Shorthorn Rhodope cow

The cow Mina, a second generation crossbreed (Rhodope dam and Montafone sire), has a live weight of 345 kilograms, and after her second calf she gave 3,251.5 liters of milk with a butterfat content of 3.54 percent. Because of its small live weight Rhodope cattle have no great importance for the meat production of the country. The fatty tissue, just as in the local grey cattle, is deposited under the skin and around the internal organs, and therefore the meat does not have a very good taste. The slaughter weight constitutes about 52 to 56 percent.

Rhodope has low capacity for work. The local population uses predominantyl oxen for work, and very seldom harnesses cows.

The improvement of Rhodope cattle is now being attempted

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by means of selection and improved feeding. Under small-farm conditions, the work of improving the breed and the selection process have so far not reached as good results as on the State farms, for general reasons and because of poor forage facilities. The heartening results achieved by pure breeding and relatively good raising, care, and feeding on the State farms are a guarantee for a notable increase of the live weight and milk productivity of Rhodope cattle by means of selection coupled with good care and feeding.

On the Department of Animal Husbandry Farm, Rhodope cows are being serviced by a Montafone bull. The resulting cross-breeds are closer to Montafone cattle in size, body shape and external appearance.

The above-quoted figures show that the improvement by crossbreeding has resulted in an increase of live weight and milk productivity and a slight decrease of butterfat content.

The Supreme Livestock Raising Soviet has (in 1947) set aside as the breeding area for shorthorn Rhodope cattle the following okoliyas: Smolen, Devin, and the mountain settlements only of Zlatograd, Kurdzhali, Momchilgrad, and Nevrokp okoliyas.

According to the latest census (1949) of domestic animals by breed, the inventory of shorthorn Rhodope cattle constitutes 6.9 percent of the total number of cattle in the country.

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**RESTRICTED****STARA PLANINA CATTLE**

The breeding area for this breed extends along both sides of Iskur Pass up to the line Dragoman-Godech-Vurshets-Mezdra-Botevgrad. In stature, Stara Planina is between shorthorn Rhodope cattle and grey Bulgarian cattle. The studies of Professor Khlebarov show that shorthorn Stara Planina cattle constitute an independent indigenous breed, and according to the opinion of others of our specialists this cattle constitutes a dwarfed variant of local grey cattle.

Description

The head is long and lean with a slightly concave orbital profile. The horns are small and thin, but longer than those of shorthorn Rhodope cattle and considerably shorter than those of Iskur cattle. The coat color is light grey, grey, or dark grey. Only a few animals show a darker coat color, and very rarely a light stripe along the back and a light ring around the snout can be found. The mucous parts around the eyes, vulva, anus, and muzzle are always black. The eyelids, the hairs at the tip of the ears, the brush of the tail, tips of the horns and hooves are black also. The skin is medium thick, soft, and forms fine creases about the neck. The dewlap is poorly developed. A characteristic of this breed is that despite its small live weight and low stature (108 centimeters) it is distinguished by great capacity for work. In broken mountainous terrain, on extremely poor, rocky

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steep roads, one pair of oxen can pull one to 2 cubic meters of timber from the hillsides to the foot of the hill. Unlike Rhodope cows, shorthorn Stara Planina cows are widely used as work animals.

Figure 32. The cow Mina, a second generation crossbreed (Rhodope dam, Montafone sire)

The live weight of adult cows in the breeding area varies between 150 and 200 kilograms, that of bulls between 250 and 300.

This breed fattens poorly, and because it is also small and late-maturing, its part in the country's meat supply is not significant. One cow or smaller ox yields an average slaughter weight of 60 to 100 kilograms. Only the larger and well-fattened steers can yield as much as 120 kilograms slaughter weight. As with Rhodope and local grey cattle, so in Stara Planina cattle the fatty tissue is deposited under the skin and around the internal organs, hence the meat is lean and not particularly tasty.

The average yearly milk production varies between 500 and 700 kilograms and the daily between 3 and 4 kilograms. Stara Planina is kept under extremely poor and primitive conditions of care and feeding. Over the winter it is scantily fed, primarily coarse roughage, and over the summer it is left to find its own

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food on the spacious Stara Planina pasturages. For these reasons, this breed is in good physical condition by the fall, and in the spring is very weak and hungry.

Placed under better conditions of care and feeding, Stara Planina cattle can be expected to increase in growth, live weight, and milk productivity.

#### BREEDS OF WORK CATTLE

##### (STEPPE BREEDS)

To the Steppe breeds of work cattle belong grey Hungarian Steppe cattle, grey Ukrainian Steppe cattle, and also the grey cattle of Moldavia, Walachia, Galicia, Bukovina, and Serbia, as well as some Italian, Spanish, and Portuguese breeds, which Professor Freitag assumes to be in close genetic relationship to grey Steppe cattle. The large group of Steppe cattle also includes English park cattle, which in the structure of its skull, the slant, form, and color of the horns and of the exterior is very similar to Steppe work cattle.

##### Ukrainian Steppe Cattle

The breeding area of this breed includes almost all of the Ukraine and part of the Northern Caucasus. Ukrainian Steppe is a typical representative of the species *Bos taurus primigenius*.

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The number of this breed before the Revolution was quite large. According to official data Russia in 1908 had 7.5 million head of grey Steppe cattle, which constituted 50 percent of the entire cattle inventory in 50 guberniyas. After the Revolution, under the influence of changed economic conditions -- the mechanization of agriculture and the great demand for milk and meat -- this breed has to a large extent been replaced by improved breeds which have been developed as dual purpose cattle with the emphasis on either dairy or beef. The grey Ukrainian Steppe breed has been maintained relatively untouched by improved breeds mainly in Poltava Oblast, partly also in Kiev Oblast, and some of the neighboring oblasts, and likewise in Rostov Oblast in northern Caucasia. This breed has a coarse build and external features typical of work cattle.

Description

The coat color is grey, silver, and dark steel grey, with a dark stripe along the back and lighter color on the belly. The head is long, followed by a well-developed hump. The horns are large, white with black tips, and in some animals attain lengths up to 80 centimeters. The neck is long and thin with medium-sized dewlap. The back is long and wide and sometimes slightly concave. The rump is sloping and pointed at the hips. The forequarters in general look better developed than the hindquarters, because the shoulders are strong and the chest is deep. The bones are well developed. This breed has a height at the withers of

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145 to 165 centimeters. The live weight of adult cows varies from 400 to 700 kilograms, and of bulls from 650 to 900 kilograms. Their slaughter weight averages 55 percent; well-fattened steers reach 800 to 1,000 kilograms and slaughter weights of up to 65 percent. Ukrainian Steppe cattle mature late. The breed barely ceases growth at 6 years of age. In addition to late maturity, another defect of this breed is its low milk productivity. The average yearly milk production of cows before the Revolution used to be 750 kilograms.

Under better conditions of care and feeding on the Collective farms grey Ukrainian Steppe cows have developed better milk productivity, ranging from 1,600 to 3,000 kilograms with a butterfat content of 4.5 to 4.75 percent. Today, many State and Collective farms in the Ukraine own grey Stepped cows with yearly milk productions of 3,500 to 4,000 kilograms and a butterfat content of 4.2 to 4.6 percent. The cow Yalosya in her eighth lactation over 300 days gave 5,122 kilograms of milk with a butterfat content of 4.1 percent; the cow Dobrodeyka in her seventh lactation gave 4,902 kilograms of milk. During 1935, 12 cows of this breed gave from 3,324 to 5,122 kilograms of milk over a lactation period.

The high live weight, healthy constitution, good meat qualities, excellent health, modesty and unusual endurance and working capacity are indeed very valuable qualities which have induced the Soviet specialists to include this breed among those to be bred according to plan, and to raise it in its purebred state in

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many areas of the Ukraine. Today, Ukrainian Steppe cattle is being bred pure in the many okoliyas of the Poltava, Daepetrovsk, Don, Kharkov, Nikolayev, and Kiev oblasts.

The improvement of the breed and selection is now being carried out under the direction of the Gradizh State Breeding Center and several State Breeding farms. The objective of the selection is to obtain large animals with accelerated maturation, improved milk and butter productivity, and good meat qualities. The outstanding and more valuable animals are entered in the General Herdbook (GPK) and the Regional Herdbook (RPK). For sires, the progeny of those bulls that have sired well-known bloodlines are preferred. Such are the bulls Lord, Petushka, Malyuk, Shamriya, and Zaporozhets. The most highly prized are the progeny of the sires Lord and Petushka, who serviced the Polivanovka Breeding Farm. In the General Herdbook 14 sons, 61 grandsons, and 37 great-grandsons of Lord are entered, as are 39 sons, 126 grandsons and 28 great-grandsons of Petushka.

The Soviet specialists have succeeded, by the proper direction of their work of improving the breed and correct feeding, to change grey Ukrainian Steppe cattle from a work breed into a multiple-purpose breed: work, beef, and dairy. Hence, in the latest classifications, grey Ukrainian Steppe cattle are included among the multiple-purpose breeds.

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**RESTRICTED**Grey Hungarian Steppe Cattle

These cattle were brought in during the great migration by the Huns and Avars from the areas along the course of the Volga. The breed is raised in a vast steppe, the Hungarian Puszta. Two types are known: the lowland type, represented in the lower steppe regions, and the highland type, which is found in Transylvania. In its external features, it is hardly distinguishable from grey Ukrainian Steppe cattle. Grey Hungarian Steppe cattle have excellent capacity for work, but are dairy-poor. Just like grey Ukrainian Steppe cattle, the cows have small udders covered with thick hair. The teats are small and thin. Being a work breed, the forequarters are better developed than the hindquarters. The bone structure is very well developed. The bones are quite coarse and convex, and the body is blocky. This breed is also sturdy and tall. The height at the withers of cows varies from 130 to 150 centimeters, that of bulls averages 150 centimeters, and that of oxen averages 160 centimeters. The horns are very large, and in some animals reach a length of one meter. The live weight of adult cows under small-farm conditions is 350 to 400 kilograms, and of those in better-fed and better-maintained herds 400 to 600 kilograms.

Figure 37. Grey Steppe cow

Figure 38. Grey Steppe bull

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The average, overall yearly milk production of this breed is 600 to 800 kilograms with a butterfat content of 4.5 to 5.0 percent. Some cows achieve yearly milk productions of up to 3,000 kilograms.

These cattle fatten well, and their meat is of medium quality.

### COMPUTATION OF THE AVERAGE MILK PRODUCTIVITY OF A HERD COW

(By herd cow is meant any cow that has been part of the herd a greater or lesser part of the year, regardless of the quantity of milk produced or of the number of calvings.)

The milk productivity of a herd has to be computed on the basis of all the cows in the herd, not only those that have concluded their lactation, as has so far been the practice with us.

The average milk productivity of a herd cow is computed in the following manner:

- (1) Compute how many days each cow has been on the farm, then compute the total of feed days for the entire herd.
- (2) Determine how many pregnant heifers have entered the herd, when each of these has calved, and how many days after calving she has remained on the farm.

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(3) The number of feed days for cows and helpers so obtained is now divided by 365, and thus the average yearly number of herd cows on the farm is derived.

(4) The average milk productivity per year or lactation period of the herd is obtained if the quantity of milk produced by all the milch cows is divided by the average number of herd cows.

(5) The average percentage butterfat content in the milk is obtained if the milk produced is recomputed into percentage figures and the quantity obtained is divided by the average milk production per year or lactation period.

Example

A farm has 73 cows at the beginning of the year. At the end of the year, due to dowries, sales, and other reasons, 8 cows have left the herd and 6 first-calvers and 4 newly-purchased cows have been added. The 65 cows which have been part of the herd during the entire year have been fed a total of 22,725 cow days, the first-calvers for 984 cow days, and the newly-purchased cows for 1,840 cow days. Hence, the entire herd had a total of 26,234 feed days, which is the equivalent of 71.8 cows fed throughout the entire year (i.e., herd cows).

The milk produced by the herd is 205,635 kilograms. This gives an average yearly milk production of 2,864 kilograms.

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All cows that have throughout all or part of the year been with the herd have given a computed total of 824,603 kilograms 1 percent milk. If this quantity is divided by the average yearly milk production, the result is a butterfat content of 4.1 percent for the entire herd.

**MEAT PRODUCTION**

Meat productivity must be considered from both the quantitative and the qualitative points of view.

The amount of meat depends on the body dimensions, live weight, slaughter weight (which in turn depends on breed, age, and condition), fattening capacity, and utilization of feed.

The quality of the meat depends on a number of factors: breed, sex, age, maturity, care, constitutional type, endocrine activity, and castration.

Best-quality meat is obtained from castrated bull and heifer calves, after which comes the meat of heifers, cows, bulls, and oxen. Meat known as baby beef is obtained from fattened 12 to 18 month old individuals of the beef breeds (short-horn, Aberdeen Angus, etc). It is best to fatten young animals. Castrated animals fatten better than those not castrated, since castration calms the animals and gives them better appetites. Condemned cows are serviced before they are allowed to fatten. Fattening is measured by weighing animals periodically in the

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mornings before feeding and watering. Adult cattle are weighed several times; growing animals are weighed every ten days up to the age of 3 months, and then at the ages of 6, 9, 12, 15, 18, and 24 months.

The capacity for growth of young and adult cattle of the local grey breed at the Dimitrov Livestock Raising Enterprise and the brown Swiss breed at the Samokov Livestock Raising Enterprise is shown by the following tables:

**A. YOUNG CATTLE**

Age	Local grey cattle		Brown Swiss cattle	
	male kg	female kg	male kg	female kg
Newborn	24.70	23.30	41.40	37.70
3 months	86.10	80.60	100.3	109
6 months	170.80	145.80	205.70	189.20
12 months	292	236.40	324	278
18 months	383.70	303.30	443	348
24 months	451.5	352.5	510	405

The daily gain up to the age of 6 months ranges, for the local grey cattle, from 600 to 900 grams; for the Brown Swiss cattle, from 800 to 1,100 grams; between the ages of 6 and 12 months the gain ranges from 500 to 700 grams and from 500 to 660 grams, respectively.

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Shorthorn calves up to the age of one year show a daily gain of 1 to 1.2 kilograms.

**B. MATURE CATTLE**

	cows kg	bulls kg
Local grey cattle	450 - 480	600 - 800
Brown Swiss	500 - 580	800 - 900
Simmenthal (USSR)	650 - 750	800 - 1,000
Grey Steppe (USSR)	450 - 550	700 - 800
Local Simmenthal crossbreeds	500 - 550	700 - 800

In the Soviet Union, young cattle under fattening show an average daily gain of 600 to 1,400 grams. Well-fattened 1½ to 2-year-olds increase their live weight by 40 percent and their slaughter weight by 80 percent.

The slaughter weight of dairy breeds ranges, depending on their condition, from 35 to 50 percent, that of dual purpose breeds from 45 to 60 percent, and that of beef breeds from 55 to 70 percent.

In our country, the following norms are accepted for the slaughter weight of local grey cattle in good condition, as determined in 1941 for the Sofia City Slaughterhouse:

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	Average live weight	Slaughter weight	
	in kg	in kg	% of live wt
Steers	461	235	50.98
Cows	320	152	47.65
Calves	153	73	47.85

The quality of the meat of local cattle leaves much to be desired.

**FERTILITY**

By fertility is understood the capacity of an animal to undergo fertilization, normal delivery, and the production of viable young.

We distinguish between primary and secondary fertility.

Primary fertility means the capacity of the animal for rapid reproduction, measured by the number of viable ova and spermatazoa produced.

Secondary fertility designates the number of offspring produced. Secondary fertility also has a qualitative aspect: in cattle breeding, it is not only desired to obtain one normal calf per cow per year, but also to utilize the maximum number of offspring produced for breeding purposes. This constitutes the so-called breeding productivity.

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Secondary fertility is measured in terms of the total number of calves born to a cow during her lifetime. A cow is said to have good fertility if she calves every year. Breeding productivity is measured in terms of the percentage of offspring used for breeding purposes from among the total number of calves born.

The figures for secondary fertility and breeding productivity so obtained are compared to the averages (norms) for the herd, in order to determine the value of the cow under consideration in regard to this aspect of productivity.

An example of the figures for local grey cattle in this respect at the Dimitrov Livestock Raising Enterprise appears in the table below.

Name of cow	Calving regularity	Number of calves born	Calves used for breeding purposes	
			No	%
Kuna 6	100	10	10	100
Petkana 13	100	9	9	100
Neda 17	100	9	6	66.66
Nedelya 45	100	10	6	60.
Kunka 28	100	8	4	50.
Tota 10	100	9	3	33.33
Totka 10	100	5	1	20.
Alpi 12	100	8	1	12.5
Byala 333	100	4	0	0.
Herd average	100	6.93	3.79	54.2

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The above data show that all the cows calve regularly every year, but for various reasons part of them were removed from the herd, hence the varying number of calves born per cow. The difference in breeding productivity is particularly striking. In that respect, the cows Kuna 6, Petkana 13, Nedelya 45, and Neda 17 have performed best; they exceed the herd averages for fertility and breeding productivity.

The fertility and breeding productivity of the bulls is computed in a like manner.

In the USSR, Hereford cows and bulls were imported in 1928 and were placed into the stations at Salsk and Orenburg and several State farms in the Caucasus. Hereford cattle is raised in the USSR in its pure state and is used for crossbreeding with local cattle in order to improve the beef qualities of the latter. Since 1931, Kirgiz cattle have been crossbred with Hereford on a large scale. For this purpose, in 1932 alone, 1,287 Hereford bulls and 311 heifers and cows were imported.

At the Moscow All-Union Agricultural Exhibition of 1939-40, many Hereford crossbreeds were shown, among them also a very well-fattened steer named Armak, which showed a slaughter weight of 71.4 percent.

Before the war (1939), there were 67,000 shorthorn cows and bulls and shorthorn crossbreeds in the USSR, among which the purebred animals numbered 1,100.

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Aberdeen Angus were first imported into the USSR in 1932.  
The results obtained so far in crossing them with local cattle  
are quite promising.

END

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