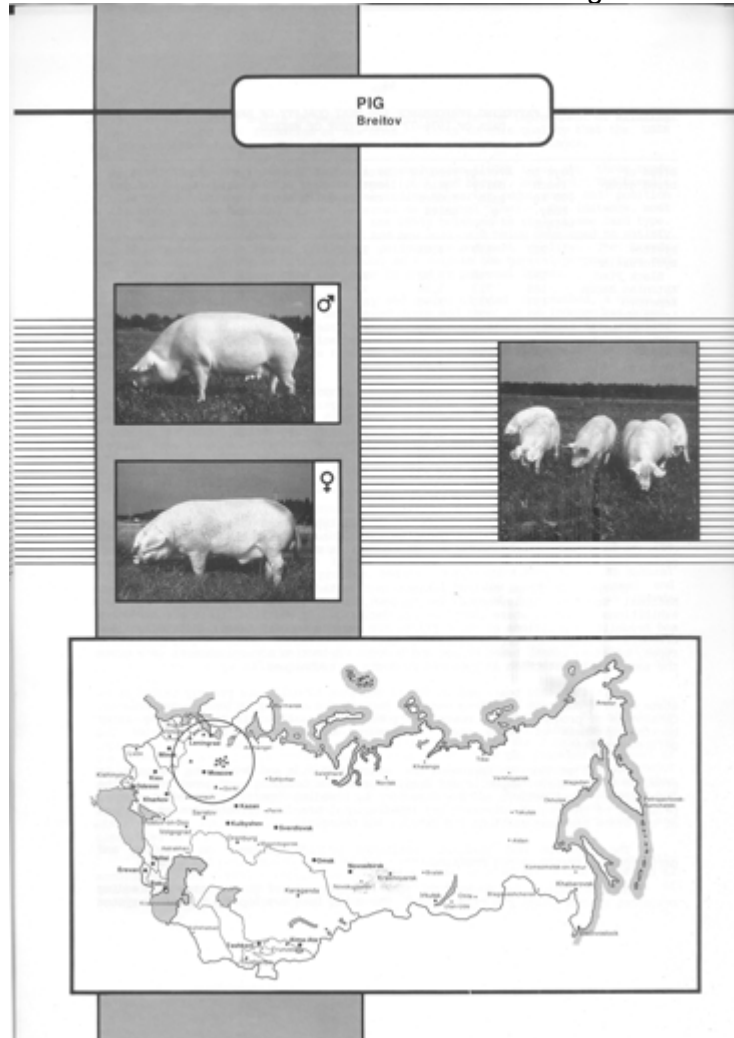

3. PIGS

A.B. Koziner and E.R. Shtakelberg



In the USSR there are 32 breeds, breed groups and types of pigs (see Table 3.1). The number includes 22 breeds that have been developed since the beginning of the Soviet era or subjected to continuous acclimatization to become adapted to the conditions in the areas of their breeding. These 22 breeds account for 29 million out of the 73 million in the Soviet Union. The rest are foreign breeds and 2- or 3-breed crosses. Development of such a large number of breeds is justified by the diversity of natural and climatic zones in the country as well as by the need to have several contrasting breeds in each region for commercial crossbreeding.

Table 3.1 PIG NUMBERS ON 1 JANUARY 1980
(in thousands)

Breed or Breed Group	Total	Purebreds
Large White	25 554.3	17 905.9
Lithuanian White	1 055.4	981.6
Ukrainian White Steppe	636.3	524.2
Latvian White	501.5	279.5
Estonian Bacon	198.2	122.8
North Caucasian	195.0	113.6
Mirgorod	186.1	136.8
Urzhum	107.3	39.9
Byelorussian Black Pied	102.1	63.7
Semirechensk	67.0	43.0
Breitov	65.8	24.9
Livny	59.6	27.2
North Siberian	58.7	24.5
Kemerovo	53.2	23.5
Tsivilsk	35.6	35.6
Murom	16.9	12.0
Aksai Black Pied	11.0	5.0
Ukrainian Spotted Steppe	7.1	5.8
Siberian Black Pied	5.3	2.3
Mangalitsa	5.0	0.7
Kakhetian	1.2	0.7
Forest Mountain	0.6	0.6

Formation of breeds began in the second half of the 19th century. It continued on a large scale through the 1930s to the 1950s and is still continuing. The technique employed in developing the country's breeds was based on the following typical method: crossing of native animals distinguished by such assets as fitness, adaptation to the local climate, strong constitution and disease resistance, with highly-productive improved European breeds, and consolidation of the valuable progeny through selection over several generations.

All the national breeds have a "strong constitution". This term covers a number of qualities indicating an animal's good health and high productivity: well-developed bones, strong legs and hoofs, good hair coat, elastic and smooth skin. Strong constitution is closely associated with high productivity (reproductive ability in particular) and is an essential requirement in the improvement of existing breeds of pigs and the formation of new ones. It is in this quality that the USSR pig breeds differ from a number of foreign breeds, Landrace for instance.

According to the instruction manual on evaluation (1976) there are three types of pig breeds, namely, general-purpose, meat (pork and bacon), and lard. The breed's type is decided during its development according to market requirement and position of the breed in the breeding system (maternal or paternal line). For instance, most of the breeds developed in

the 1940s and the 1950s belonged to the extreme lard type. Today, the old breeds are being improved and new ones are being developed to satisfy such economic needs as better fattening performance and meat quality. The breeds used in breeding systems as maternal belong as a rule to the general-purpose type and show excellent prolificacy. The meat type is used in paternal lines.

When a certain level of productivity and number of head is reached, a group of animals becomes established first as a breed group and then as an independent breed. To establish a breed group at least 3000 breeding sows and 300 boars are required with not less than 3 breeding lines and 6 families; for a breed 5000 sows, 500 boars, 6 lines and 12 families are needed. Each line should be composed of at least two branches.

Formation of breeds is a continuous process. The most productive and best adapted to the local conditions replace the inferior breeds whose numbers at first gradually decline and then they disappear altogether. Improvement of progressive breeds on the basis of intra-breed selection and infusion of blood and crossbreeding produces new regional types which may later be transformed into breed groups and breeds. Three new crossbred meat types have recently been recognized - Don (Donskoi), Kemerovo and Poltava. (This Kemerovo type must not be confused with the Kemerovo breed described later).

The following 14 breed groups disappeared during the last two decades: Alabuzin, Chausky, Dnieper, Dobrinka, Pridonskaya, Ilevlev, Kalikin, Krolevets, Meshchevsk, Moldavian Black, Omsk Grey, Podolian, Rossosh, Slutsk Black Spotted. On the one hand this is a legitimate process as it involves the expansion of the breeding area of more productive breeds. On the other hand, preservation of the declining breeds is an important problem, because they possess such assets as natural adaptation, resistance to stress, high quality of meat, low protein requirement and many others which tend to be lost as the productivity of the progressive breeds increases.

Preservation of rare or declining breeds is carried out at special farms and centres for protection of the germ plasm of individual breeds. Deep freezing storage of boar semen in specially built centres will be carried out when techniques are perfected.

Improvement of purebreds is conducted at 93 breeding centres (plemzavods), 150 breeding state farms (plemkhoz) and 1257 breeding farms (plemferma). Plemzavods are the leading breeding establishments. They carry out research into techniques of improvement and formation of new lines. Animal breeding is their main activity and the level of production is higher than in other farms. In the plenkhoz the level of breeding and production is a little lower. Pig breeding is not always the major activity on these farms. Plemfermas are mainly involved in line crossing rather than in pure breeding. Plemkhoz and plmfermas in their breeding programmes are daughter establishments of leading plenkhozes. Plemzavods are controlled by the ministries of agriculture of the Union or of the Republics; plmfermas are controlled by the region.

Progeny and performance tests of all breeding animals are carried out annually according to the central directive on evaluation. The best animals (1200 boars and 12 000-14 000 sows) are entered into state herdbooks by

breeds. The State Test of breeds is conducted once every 10 years (see Table 3.2).

Table 3.2 FATTENING PERFORMANCE AND MEAT QUALITY OF BREEDS.

DATA OF 1976-77 STATE TEST OF BREEDS

Breed or breed group	Days to reach 100 kg body weight	Average daily gain g	Feed/kg gain fodder units	Carcass length cm	Fat thickness at 6-7th rib mm	Eye-muscle area cm ²	Ham kg	Meat in carcass %
Breitov	217	659	4.03	92	38	26.7	10.2	55.2
Byelorussian Black Pied	182	748	3.92	93	37	25.7	10.2	56.1
Estonian Bacon	188	713	3.86	99	26	31.3	10.7	58.8
Kemerovo	193	730	3.90	89	33	28.8	10.3	58.9
Large White	192	725	3.91	94	32	28.2	10.5	57.8
Latvian White	194	656	4.01	94	33	29.0	10.5	55.0
Lithuanian White	190	683	4.04	95	32	30.5	10.5	54.5
Livny	190	785	3.80	92	41	23.9	10.6	52.5
Mirgorod	197	669	4.07	94	32	26.7	10.0	54.9
Murom	204	727	3.92	91	36	26.4	10.4	57.1
North Caucasian	185	678	3.97	92	38	27.5	10.1	55.5
North Siberian	200	716	4.01	90	37	28.3	10.4	53.3
Semirechensk	198	689	4.01	91	34	28.6	10.6	59.8
Tsivilsk	221	697	3.93	93	35	26.9	10.4	54.5
Ukrainian White Steppe	209	655	4.16	92	35	27.5	10.6	53.5
Urzhum	200	679	3.98	92	33	26.9	10.1	57.5

A census of all breeds is conducted at all types of farm every five years. A State Inspection of pig breeding farms is carried out at a similar interval. Breed councils have been established which make decisions on the selection policy for each breed, region and breeding herd.

There is an annual central exhibition (located at the Permanent Exhibition of National Economic Achievements in Moscow), as well as Republic and regional exhibitions and shows where champions are declared. In addition there are All-Union and Republic competitions at which prizes are awarded to best farms, institutions and breeders. Prizes and certificates are issued to breeders of new highly-productive types, breeding lines, breed groups and breeds. Selection accomplishments are given the same legal protection as patented products or techniques.

About 4500-4800 boars and 15 000-18 000 sows annually are progeny tested at 62 state control and test stations and 117 centres for testing fattening performance. Catalogues of progeny-tested boars are published annually. On the breeding farms backfat thickness of young stock is measured ultrasonically as a part of the performance test.

Overall guidance on improving the existing breeds and developing new ones is provided by the State, Republic and Zonal Centres for breeding and

genetics. On the local scene these activities are directed by breeding experts of breeding farms, personnel of the region, district and interregional breeding directorates as well as of the State breeding stations (in Estonia and Georgia).

The research and academic institutes provide guidance on breeding and participate directly in pig breeding.

Much attention is devoted to the rational use of the country's breeding resources in commercial pig production. There has been developed a balanced system in the USSR of vertical integration of breeding and reproduction farms on the pyramid principle depending on the selection goals and breeding level. There have been established 15 Republic, 112 region and territory successful pig breeding systems based on two- and three-breed crossing.

In this monograph the breeds are described in the following order:

GENERAL-PURPOSE BREEDS

Breitov

Byelorussian Black Pied

Kemerovo

Large White

Latvian White

Lithuanian White

Livny

Murom

North Caucasian

North Siberian

Semirechensk

Ukrainian White Steppe

MEAT-TYPE BREEDS

Estonian Bacon

Urzhum

LARD-TYPE BREEDS

Mangalitsa

Mirgorod

Ukrainian Spotted Steppe

BREED GROUPS (general-purpose)

Aksai Black Pied

Forest Mountain

Kakhetian

Siberian Black Pied

Tsivilsk

GENERAL-PURPOSE BREEDS

BREITOV (Breitovskaya)

The breed was developed by crossbreeding in collective farms of the Yaroslavl region under the guidance of V.M. Fedorinov, Director of the Breitov State Breeding Station and G.F. Makhonina, Expert Breeder of the station.

Prior to the 1917 Revolution the local landowners imported the Large White and Middle White from Great Britain and the Danish Landrace from Denmark as well as improved lop-eared pigs from Latvia and Lithuania and Polesian pigs from Byelorussia. Interbreeding of the imported breeds and crossing with the native animals produced a large population of improved crosses.

A great role in the development of the Breitov was played by V.M. Fedorinov's system of dividing the population into 16 unrelated groups. The subsequent crossing of these groups allowed the concentration, within a short time, of inherited qualities without inbreeding.

During the development of the breed the emphasis was on the extensive use of locally available feeds: potatoes, root crops, green-cut clover, clover seed bran and flax chaff, by-products of butter and cheese factories, with only a small amount of fodder grain.

The Breitov was accorded official recognition in 1948. At the outset it was primarily a lard type, but as the consumer demand for lean pork increased the Breitov has been bred for improved meat qualities. At present, the breed is classified as general-purpose.

The total number of head was 216 000 in 1960, 62 000 in 1964 and 48 000 in 1969. As of 1 January 1980 the Breitov numbered 65 800 including 29 400 purebreds of which 1100 were breeding boars, 4500 breeding sows and 2400 on test.

The breed has a medium-sized, wide head with a dished face, large drooping ears, wide and deep chest, wide back and loin, hard and sometimes wrinkled skin and dense bristles. The colour is white; some animals may have coloured spots on the body.

In 1983 evaluation of animals at breeding farms produced the following data: live weight of 36-month-old boars - 297 kg, sow live weight - 236 kg, boar body length - 177 cm, sow body length - 161 cm, litter size - 10.5, weight of one-month-old litter - 51 kg, weight of two-month-old litter - 157 kg. The test results of the breed's fattening performance were as follows: time to reach 100 kg live weight - 208 days, feed/kg gain - 3.98 fodder units, backfat thickness - 31 mm, length of carcass - 93 cm, ham weight - 10.3 kg. In 1983 the breed's champion was the boar Talisman 55 owned by Gorodishche breeding state farm of Pskov region. Its results were as follows: average daily gain - 724 g, feed/kg gain - 3.82 fodder units, length of carcass - 96 cm, backfat thickness - 28 mm.

The Breitov meat is distinguished by bright colour, excellent marbling and high protein quality index (ratio of tryptophan to hydroxyproline). While for all breeds the index averages 8.04, and in the Large White it is 8.06, for the Breitov its value is 8.60.

Sows farrow twice a year and may remain prolific until the age of 5-6 years old.

The renowned assets of the Breitovskaya are its hardiness, good adaptability to the climate in the northwest of the Russian Republic, ability to consume bulky feeds in large quantities and to gain rapidly on low-concentrate feeding as well as excellent dietary qualities and palatability of the meat.

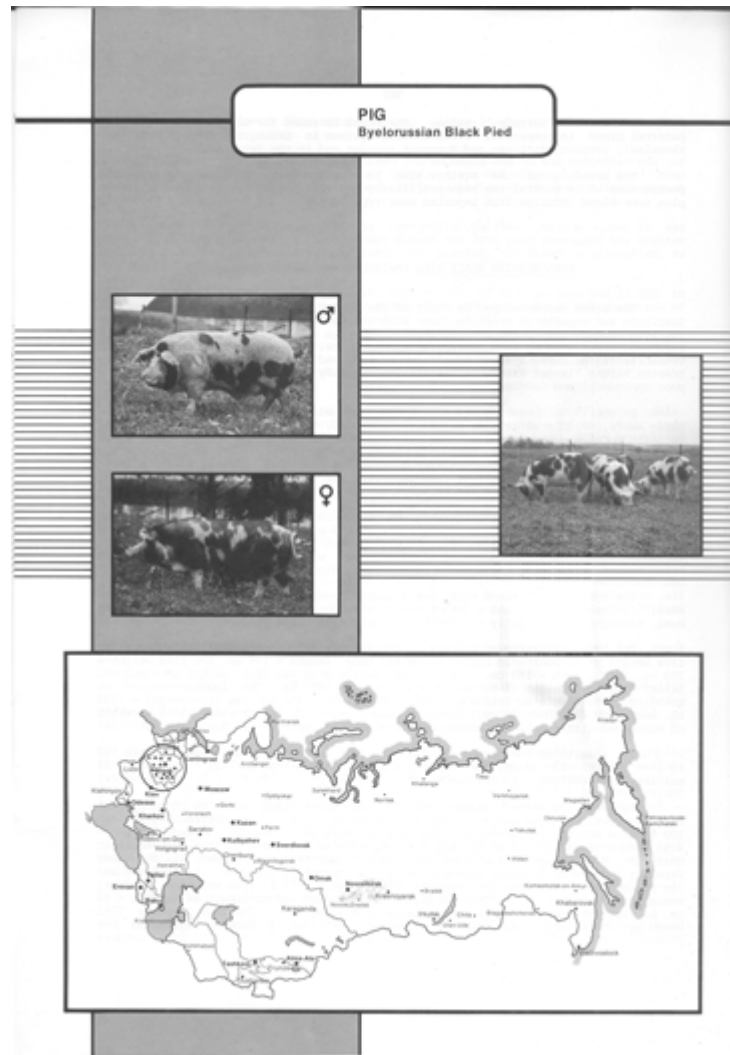
Crossing the Breitov with other breeds produces good results. For example, the offspring of Large White sows and Breitov boars gave the following results: litter size - 12.2, weight of the newborn - 1.48 kg, weight of one-month-old litter - 58 kg, live weight of 60-day-old piglet - 23.3 kg, time to reach 100 kg live weight during the performance test - 173 days, average daily gain - 811 g, feed/kg gain - 3.85 fodder units.

As the Breitov breed cannot compete with the Large White in litter size and the weight of month-old litter nor with the Landrace in meat quality its expansion has slowed down.

The breed consists of 16 boar lines and 24 sow families.

Purebred animals are raised at 3 breeding state farms (Druzhba in Leningrad region, Gorodishche in Pskov region, Drozdovski in Smolensk region) and at 7 breeding collective farms in Yaroslavl region. The breed is zoned for use as a maternal and paternal breed in commercial crossbreeding systems in Leningrad, Pskov, Smolensk, Yaroslavl, Ivanovo, Kostroma and Murmansk regions and in the Tatar ASSR.

The breeding of the Breitov aims to improve meat quality and fattening performance while maintaining high prolificacy and milk production through selection plus some blood infusion from imported meat-type breeds.



BYELORUSSIAN BLACK PIED (Belorusskaya chernopestraya)

The breed was developed by staff of the Byelorussian Animal Breeding Research Institute and experts of breeding farms with the participation of N.M. Zamyatin. In the 19th century the native lop and short-eared pigs were interbred and crossed with imported breeds such as the Yorkshire, Middle White, Tamworth and Large Black. The crossbreeding produced a large population of improved native animals distinguished by greater height, larger litter size, earlier maturity and an ability to thrive with poor management and feeding.

In the 1920s crossbreeding of the improved native Byelorussian breed with the Large White, Middle White and Berkshire continued. The genetic influence of the Estonian Bacon and the (Swedish) Landrace has contributed to the Byelorussian Black Pied.

Selection on the basis of the main economic characteristics, ruggedness of constitution and vitality was intensively carried out in the process of development.

Classified as general-purpose it was recognized as a breed group in 1957 and as a breed in 1976. The number of head has varied as follows: 74 000 in 1964; 46 000 in 1969 and 73 000 in 1974. By the early 1980s the total number reached 102 000

including 63 700 purebred animals, of which 5 800 were breeding boars, 1 000 boars being tested, 7 300 breeding sows and 5 500 sows being tested. The Byelorussian Black Pied has a light head, straight face, and medium lop ears. It has good depth and width of body, straight and wide back, moderately plump hams, straight and correctly set legs. The colour is black pied.

The 1983 evaluation of animals at breeding farms produced the following data; live weight of 36-month-old boars - 298 kg, body length - 176 cm, sow live weight - 243 kg, body length - 163 cm. The average litter size was 10.1, weight of month-old litter - 50 kg, weight of two-month-old litter - 160 kg.

The figures obtained at breeding centres were as follows: boar live weight - 303 kg, sow live weight - 246 kg, boar body length - 176 cm, sow body length - 163 cm, litter size - 10.5, weight of month-old litter - 52 kg, weight of two-month-old litter - 167 kg.

The results of the breed's performance test are as follows: time to reach 100 kg live weight - 194 days, feed/kg gain - 3.64 fodder units, backfat thickness - 31 mm, length of carcass - 95 cm, ham weight - 10.6 kg.

In 1983 the record holder was the boar Maket 1463 owned by Goncharovski breeding centre of Lyakhovichski district in Brest region. Its descendants gained 100 kg live weight in 194 days; the average daily gain was 728 g, feed/kg gain - 3.44 fodder units, length of carcass - 96 cm, backfat thickness at the 5-6th thoracic vertebra - 30 mm, eye-muscle area - 27 cm².

Another record holder was the boar Zarechny I owned by Zhgunski breeding centre of Dobrushski district in Gomel region. Its progeny gave the following results: time to gain 100 kg live weight - 183 days, average daily gain - 718 g, feed/kg gain - 3.58 fodder units, length of carcass - 94 cm, backfat thickness - 30 mm, eye-muscle area - 29 cm². The boar Zarechny 7763 owned by Voronovski state farm of Voronovski district in Grodno region had the following progeny performance: 192 days, 744 g, 3.28 fodder units, 96 cm, 36 mm and 29 cm² respectively.

The Byelorussian Black Pied is distinguished by high resistance to disease and to stress.

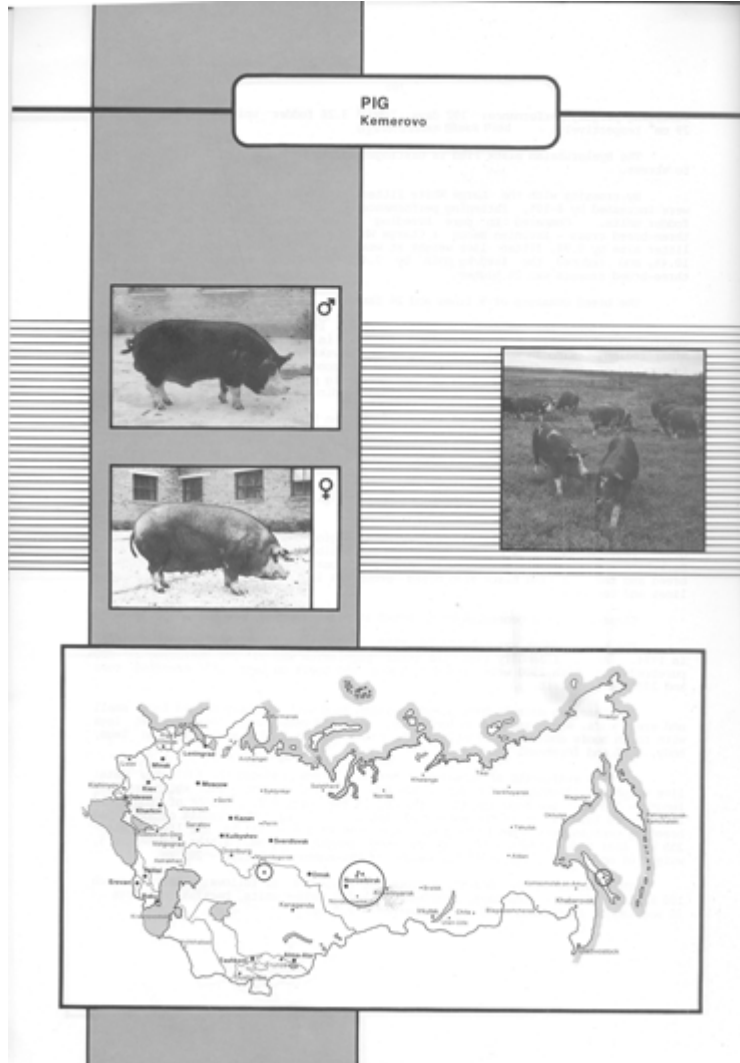
By crossing with the Large White litter size and weight of month-old litter were increased by 8-10%, fattening performance by 2-5% and feed/kg gain by 0.2-0.3 fodder units. Compared to pure breeding of the Byelorussian Black Pied the three-breed cross - Estonian Bacon x (Large White x Byelorussian Pied) - increased litter size by 9.9%, litter live weight at weaning by 17% and average daily gain by 10.4%, and reduced the feed/kg gain by 7.4%. The average meat yield in the three-breed crosses was 2% higher.

The breed consists of 9 lines and 26 families.

At present the Byelorussian Black Pied is improved and bred at 4 breeding centres (Goncharovski in Brest region, Zhgunski in Gomel region, Dzerzhinski in Minsk region, Lenino in Mogilev region), at Voronovski state breeding farm in Grodno region and at 9 breeding farms. The breed is zoned for raising in all parts of Byelorussia and accounts for 0.3% of the

total pig population. In addition it is used as a maternal and paternal breed in crossbreeding systems.

The further improvement of the Byelorussian Black Pied is directed towards increasing litter size, quality of meat and adaptability to the conditions of commercial pig units.



KEMEROVO (Kemerovskaya)

The breed was developed in Kemerovo region under the guidance of A.I. Ovsyannikov and I.I. Gudilina by crossing native Siberian sows with Large White and Berkshire and to a lesser extent with Large Black boars. Blood of the North Siberian

breed and the Siberian Black Pied breed group was later introduced to create some lines and families.

Classified as a general-purpose breed it was officially recognized in 1961. The total number was 133 000 in 1960, 70 000 in 1964, 39 000 in 1969, 58 000 in 1974. As of 1 January 1980 the total population was 53 200 including 23 500 purebreds, of which 2300 were breeding boars, 500 boars on test, 2800 breeding sows and 2700 sows on test.

The Kemerovo animals have a medium-sized head with slightly dished face, small and erect ears, wide and medium-long body, wide and deep chest, correctly-set legs with tough hoofs and dense bristles. The colour is black with small spots on legs, body, tail and forehead.

In 1983 evaluation of animals at breeding farms produced the following data: live weight of 36-month-old boars - 326 kg, sow live weight - 240 kg, boar body length - 176 cm, sow body length - 159 cm, litter size - 9.7, weight of month-old litter - 53 kg, weight of two-month-old litter - 175 kg.

The results obtained at breeding centres were somewhat higher: boar live weight - 338 kg, sow live weight - 255 kg, boar body length - 180 cm, sow body length - 160 cm, litter size - 10.5, weight of month-old litter - 61 kg, weight of two-month-old litter - 205 kg.

The results of the breed's performance test were as follows: time to reach 100 kg live weight - 185 days, feed/kg gain - 4.0 fodder units, backfat thickness - 30 mm, length of carcass - 94 cm, ham weight - 9.7 kg.

In 1983 the breed's champion was the boar Zhemchug 429 owned by Yurginski breeding centre. Its live weight was 352 kg and body length 190 cm. Its progeny gave the following results: time to gain 100 kg live weight - 190 days, average daily gain - 729 g, feed/kg gain - 3.99 fodder units, backfat thickness - 27 mm. In 1984 the breed's champion was the sow Primernaya 590 owned by the same breeding centre. Its results were: litter size 13.0 head, live weight of one-month litter - 63 kg, weight of two-month-litter - 216 kg.

The breed consists of 12 boar lines and 16 sow families.

The Kemerovo breed is improved at Yurginski leading breeding centre, and Chkalov breeding state farm in Kemerovo region, and at breeding farms in Kustanai region and in Sakhalin.

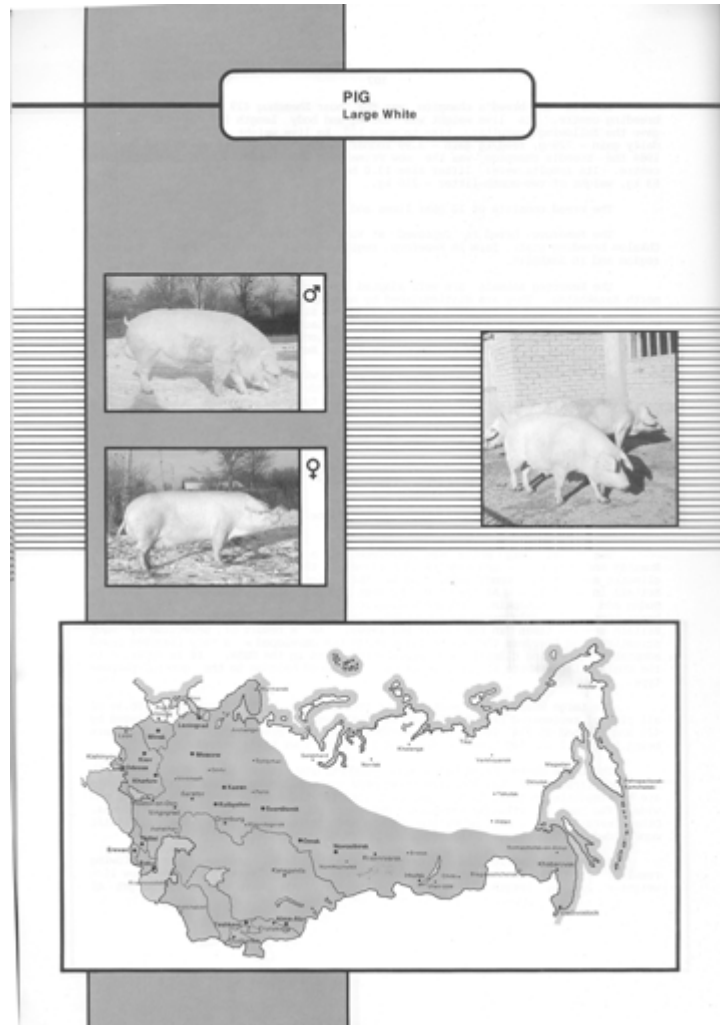
The Kemerovo animals are well adapted to the severe climate of Siberia and north Kazakhstan. They are distinguished by hardiness and remarkable vitality. The breed is widely used in crossing with the standard Siberian breeds such as the Large

White, North Siberian Landrace and the Siberian Black Pied. The breed is zoned for raising in Kemerovo, Omsk, Chita and Sakhalin regions, in Krasnoyarsk territory, in the Tuva ASSR and in Kustanai region of the Kazakh Republic.

Part of the Kemerovo population was mated with the Landrace to improve meat quality. As a result there was developed and accorded official recognition in 1978 a new meat-type of the Kemerovo breed (KM-1). The type is employed in developing a

Siberian regional type of a new meat breed.

The breeding of the Kemerovo is directed at improving prolificacy, meat quality and strength of bone.



LARGE WHITE (Krupnaya belaya)

The Soviet Large white was developed as a result of many years' work by Russian and Soviet breeding experts to acclimatize the English Large White in varying climatic and feeding conditions. Large White pigs were first imported from the Britain in the 1880s. At the time the best pig breeding farms were owned by A.F. Budna and M.M. Shchepkin. Crossbreeding local pigs with the English Large White boars generated highly productive crosses. Later Large White pigs were imported from Britain several times in the 1920s and 1960s. As a result of selection by many scientists and breeders the Soviet Large White was developed - a very flexible breed adaptable to varying climatic and natural conditions in the USSR. It is superior to the English Large White in many respects. The breed belongs to the general-purpose type.

The Large White is the most popular breed in the USSR accounting for 86.5% of all pigs of recognized breeds. During the last two decades its numbers increased by 42% and reached 25 554 000 in 1980, including 370 600 breeding boars, 56 800 boars being tested, 2 382 000 breeding sows and 1 639 000 sows being tested.

The Large White breed has a high productivity; sows are good mothers with high prolificacy, it has a medium-sized head with slightly dished face. The ears are intermediate in size, thin, elastic, tilted forward and erect. Chest is deep and wide. The back is straight and wide. Hams are plump extending down to the hocks. Other features are: well-developed, strong and correctly set legs; hard, elastic non-folded skin; dense but thin bristles. Its colour is white.

In 1983 evaluation of animals on breeding farms produced the following results: live weight of 36-month-old boars - 298 kg, body length - 179 cm; sow live weight - 235 kg, length - 163 cm. The average litter size was 10.3, weight of month-old litter - 53 kg, weight of two-month-old litter - 165 kg.

The figures obtained at breeding centres were somewhat higher: boar live weight - 322 kg, sow live weight - 233 kg, boar body length - 183 cm, sow body length - 163 cm, litter size - 11.2, weight of month-old litter - 58 kg, weight of two-month-old litter - 192 kg.

The results of the breed's performance test are as follows: time to reach 100 kg live weight - 205 days, feed/kg gain - 4.03 fodder units, backfat thickness - 30 mm, length of carcass - 95 cm, ham weight - 10.5 kg.

In 1984 the breed's champion was the boar Sulzh 239 owned by Krekshino breeding state farm in Moscow region. It gave the following results: live weight - 364 kg, body length - 196 cm; progeny test: time to gain 100 kg live weight - 189 days, feed/kg gain 3.85 fodder units, backfat thickness - 28 mm, ham weight - 10.7 kg.

In the same year the champion in the reproductive and fattening test was the sow Yasochka 59280 owned by Primalkinski breeding centre in the Kabardino-Balkar Autonomous Republic. It gave the following results: litter size - 13.5, weight of one-month-old litter - 61 kg, weight of two-month-old litter - 216 kg, time to gain 100 kg weight during the fattening performance test - 186 days, feed/kg gain - 3.59 fodder units, backfat thickness - 29 mm, length of carcass - 95 cm.

The Large White surpasses other breeds in such qualities as high and lasting prolificacy and the ability to adapt itself in any climatic conditions. Sows are renowned mothers.

The breed consists of over 100 lines and of a large number of sow families. The breed is divided into 17 separate populations, each bred in a particular group of farms consisting of a leader breeding centre and 3-5 branch farms with a single breeding programme. The Large White is being improved at 55 breeding centres, 72 breeding state farms and 888 breeding farms. The leading farms are Nikonovskoe, Bolshoe Alekseeskoe, Konstantinovo and Achkasovo breeding centres in Moscow region, Ventsy-Zaria in Krasnodar territory, Velikaya Buromka in Cherkassy region and Vasilievka in Sumy region.

The breed is classified for raising in all parts and zones of the USSR excluding Latvia and Lithuania which have their own white breeds (see below). It is employed as the principal maternal line in many breeding systems.

The Large White was used in developing the majority of Soviet breeds. At present it is being selected for improved fattening performance and meat quality while maintaining high prolificacy and good constitution.

Recently three highly productive regional types have been developed. The Byelorussian intra-breed type (BKB-1) was officially recognized in 1975, the

Moscow meat type (MM-1) in 1981 and the Estonian intra-breed type (EKB-1) in 1982.