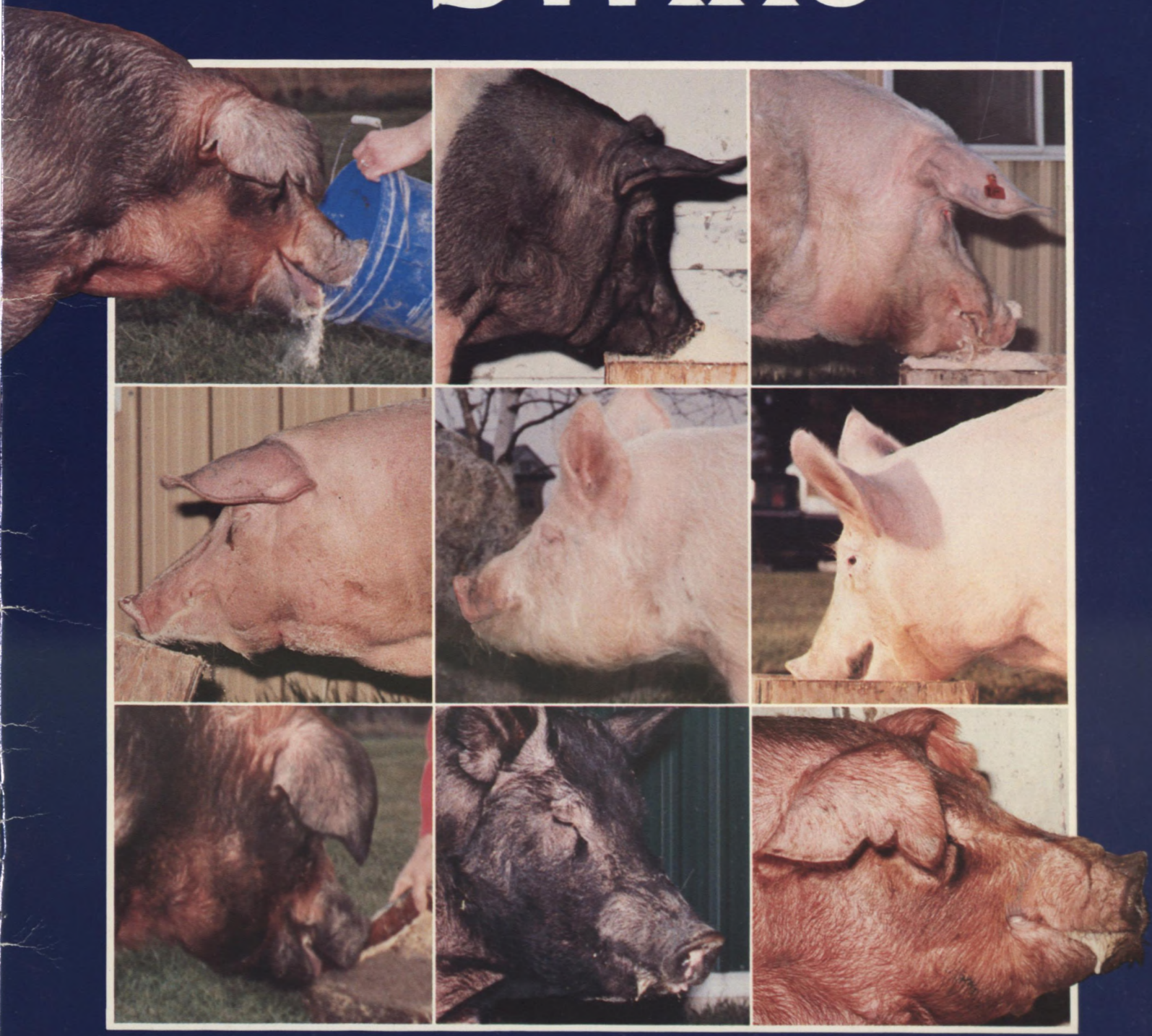
Canadian Swine



External Affairs Canada
Affaires extérieures Canada

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Canadian Swine

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The Value of Breeding Stock

As the world search for more efficient methods of meat production continues, increasing attention is focussed on swine production and the opportunities it opens for the development of a stable and economical meat supply.

For centuries, the pig, feeding on whatever kind of forage was available, has been used to produce meat for man. This principle of usage has not changed but the methods of feeding and management have been dramatically improved. Industrialization of pig meat production is now well advanced in many countries. Large enterprises with hundreds of breeding sows are commonplace creating a specialized agrobusiness from the cottage industry of the past.

Foundation breeding stock of the highest quality is paramount among the major requirements of the commercial producer. High quality breeding stock implies a capability of superior performance and the uniform transmission of that capability to succeeding generations. Four of the basic criteria of performance in swine are: litter size at weaning, growth rate, feed conversion efficiency and carcass merit.

Most swine populations throughout the world can be improved through the introduction of breeding stock in which desired characteristics have been genetically concentrated.

This booklet outlines the beneficial characteristics of Canadian breeding stock and how they meet quality requirements.

The Canadian Swine Industry

The Canadian swine industry is relatively specialized and consists of two major components: the purebred swine breeder and the commercial feeder. There are a significant number of producers who grow both foundation purebred breeding stock and the finished feeder animal ready for slaughter.

The major breeds of the Canadian swine industry are the Yorkshire, Landrace, Duroc, Hampshire and to a lesser extent, the Lacombe. Annual purebred registrations average 26,000 with 47 per cent Yorkshire, 34 per cent Landrace, 11 per cent Duroc, 6 per cent Hampshire and 2 per cent other breeds. Each breed has its own performance characteristics in terms of litter size, growth rate, feed conversion efficiency and yields of carcass structure and composition.

In most modern swine operations, a set of repeatable combination of breeds is selected to achieve maximum efficiency in live performance and to produce carcasses that best suit the market. The objective of the purebred swine industry is to provide these enterprises with high performance breeding stock that will

Commercial rearing

Farrowing barn

reproduce predictably in both single-breed and cross-breeding program.

Canadian swine are raised in total confinement on concrete and/or metal flooring with little or no bedding. As a result purebred swine breeders have been highly selective in using only breeding stock which is structurally sound with good feet and legs. This provides the buyer with breeding stock which will stand up to enclosed intensive rearing conditions.

Common Commercial Crosses

YORKSHIRE **X** LANDRACE

YL GILT **X** DUROC or HAMPSHIRE BOAR

YORK/LAND/DUROC OFFSPRING
YORK/LAND/HAMPSHIRE OFFSPRING } WHICH ARE SLAUGHTERED

YORKSHIRE **X** LANDRACE DUROC **X** HAMPSHIRE

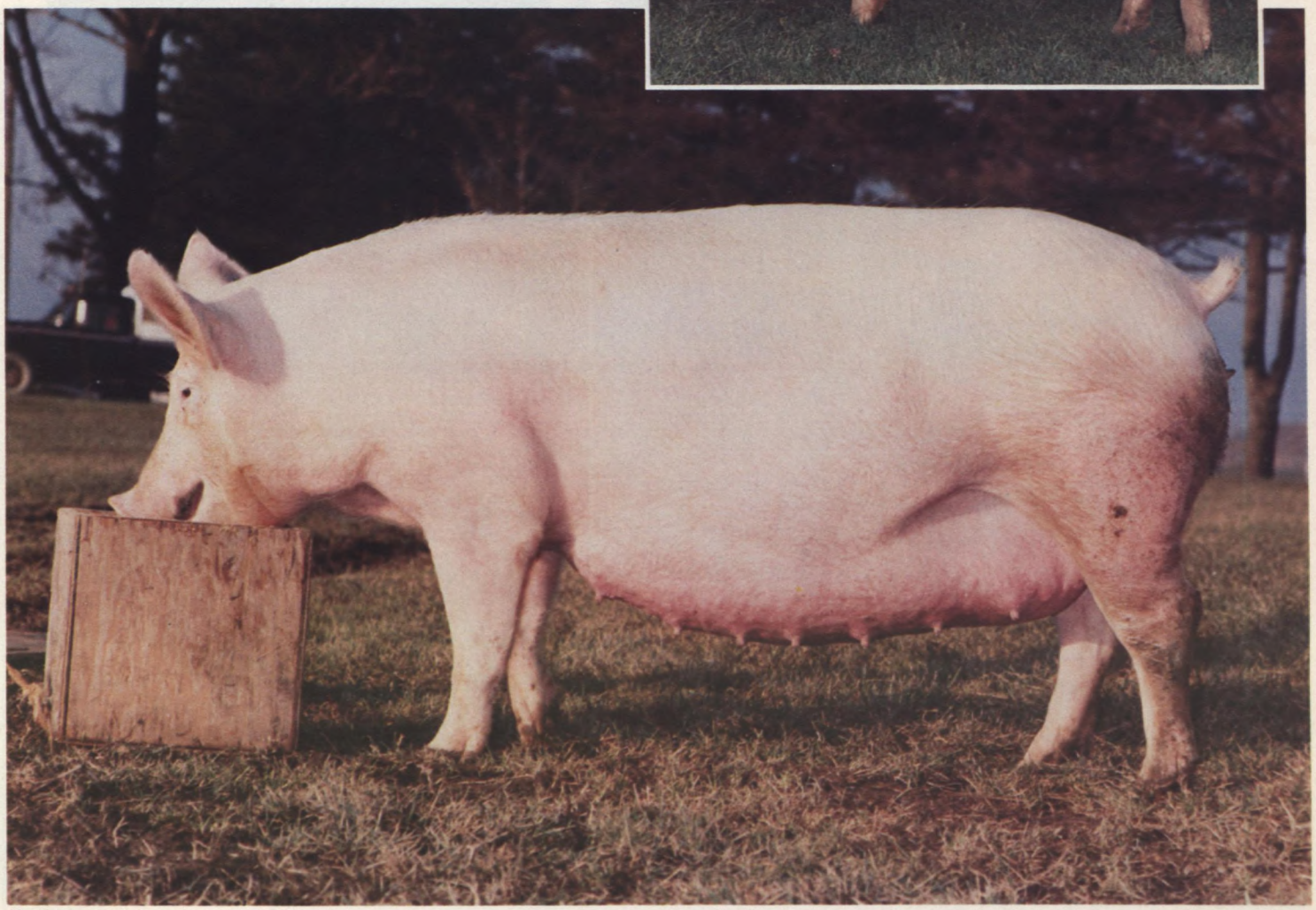
YL GILT **X** DH BOAR

YORK/LAND/DUROC/HAMP OFFSPRING WHICH ARE SLAUGHTERED

This represents two of the more common crosses used by Canadian swine producers. The second cross is designed to achieve the maximum effect from heterosis while at the same time maintaining predictability in quality of the offspring.

Yorkshire boar

The Canadian Yorkshire



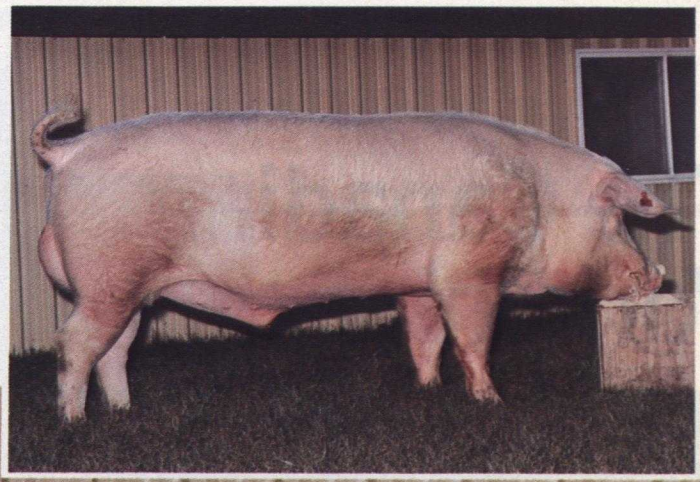
Yorkshire sow

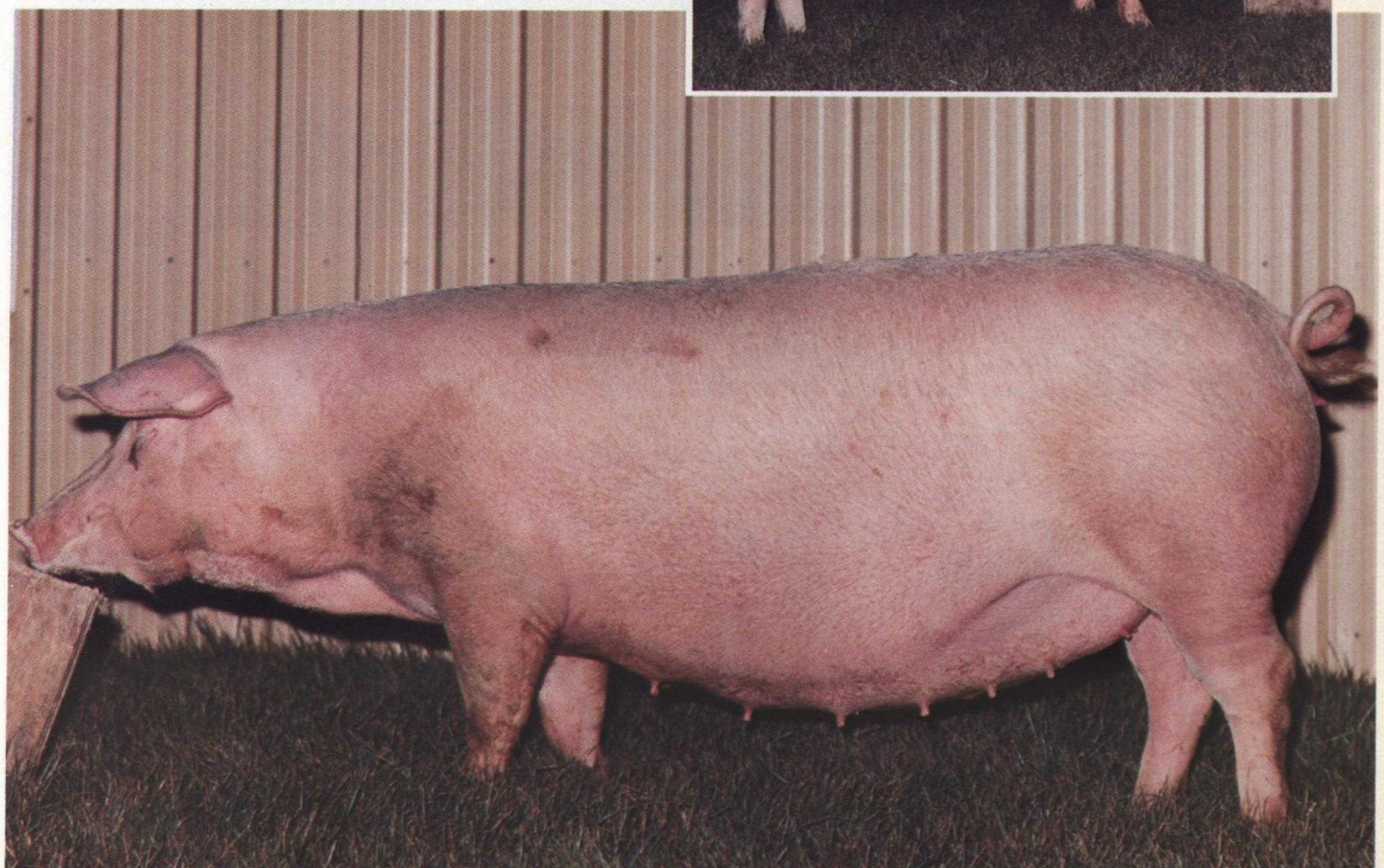
The Canadian Yorkshire breed is the most numerous in Canada. Registration in 1984 was 11,087. The Yorkshire is a white breed with erect ears and good housekeeping habits. The sows are very prolific, possess good mothering and milking ability, are intelligent, possess vigour and are efficient feed converters. Good Yorkshire brood sows consistently farrow more than 10 pigs per litter.

The Canadian Yorkshire was originally developed to serve the British demand for quality Wiltshire bacon. Emphasis was placed on the length of side and leanness of meat. While the Yorkshire is essentially a long lean pig, Canadian breeders have produced certain strains with heavier muscle based on loin and ham weight, larger frames and heavier bone structure.

The Canadian Landrace

Landrace boar



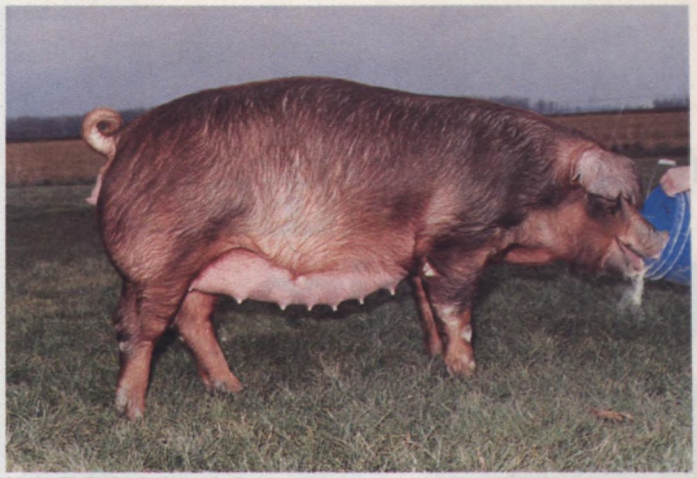


Landrace sow

The Landrace breed originated in the Scandinavian countries, and has been further developed in Canada since its introduction in 1950. Registrations in 1984 were 7,393. The breed is noted for prolificacy and good mothering ability. The carcass is similar in merit to the Yorkshire, lean with a high proportion of ham.

The Landrace is a white breed with floppy ears, used extensively in Canada as a crossing breed and is noted as a bacon pig. The Yorkshire-Landrace crossbred female is a very popular pig among commercial swine producers.

Duroc sow



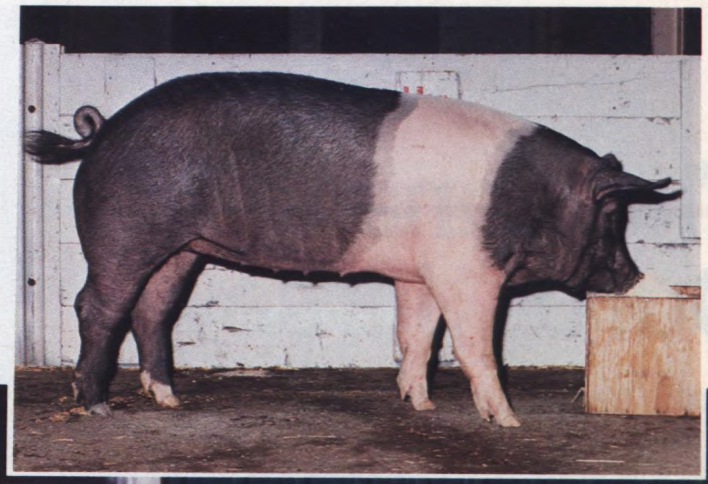
The Canadian Duroc Jersey

Duroc boar

The Duroc Jersey originated in the United States and since its introduction into Canada has become one of the most popular breeds in the country. The registration for 1984 was 1,867. Durocs are solid red in colour, a meaty type animal and are noted for their carcass characteristics and feed efficiency. It has strong feet and legs making it an excellent choice for rugged commercial feeding conditions. The Duroc is also noted for large litters, a characteristic retained even when used in a cross-breeding program.

Durocs are being used as a terminal breed in cross-breeding programs as well as the third breed in rotational cross-breeding.

Hampshire gilt



The Canadian Hampshire

Hampshire boar

Current efforts in almost all countries to produce lean pork have placed emphasis on the Hampshire as a crossing breed. This meat-type pig has been developed to provide greater carcass muscling and when used in a final cross there is evidence of superior carcass quality in the offspring. The modern Hampshire exceeds other breeds in producing a leaner, meatier carcass.

Hampshire pigs are black in colour with a white belt around the body which includes the shoulder and front legs. The breed is exceptionally well muscled, somewhat shorter than the Yorkshire and on average has numerically smaller litters. The registrations in 1984 were 1,492.

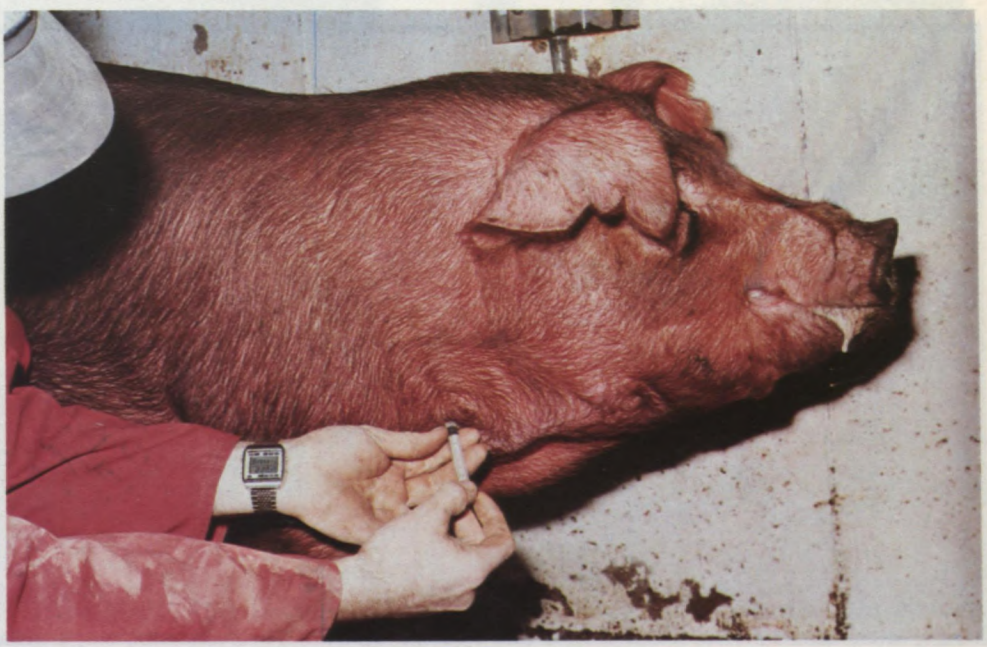
Animal Health

Canada is free from serious livestock diseases including foot-and-mouth disease, rinderpest, swine brucellosis, hog cholera, vesicular exanthema, African swine fever, swine vesicular disease and pseudo-rabies. The Animal Disease and Protection Act makes provision for controls to ensure that such livestock diseases will never become established in the country. If they should appear, the Act provides for their eradication through quarantine and slaughter. There are quarantine stations for imported swine at Lévis, Québec and Edmonton, Alberta and a maximum security quarantine station on Grosse Isle in the St. Lawrence River near Québec City.

The incidence of PSS (Porcine Stress Syndrome) is less than 1.7 per cent in the Canadian swine herd. Agriculture Canada requires that all boars that pass through the federal government test stations undergo a Halothane test. Any animals that react positively are slaughtered. The breeder is advised of the problem so the parentage can be identified and steps taken to eliminate occurrence in future generations.

Canada's national veterinary service consists of about 3,800 veterinarians who attend to the needs of all swine farms. Agriculture Canada's Food Production and Inspection Branch employs 560 veterinarians full time. The remainder are in private practice and ensure the Canadian farming community of up-to-date services and advice to monitor the day-to-day health of animals.

All herds registered in the National Record of Performance (ROP) program must be enrolled in



a herd health program that is supervised by the provincial governments. As well, extensive health surveys are conducted and maintained on a continuing basis, by Agriculture Canada health inspectors, through the sampling of blood from mature swine at all federal government inspected slaughter plants. This provides continuing, up-to-date monitoring of the health of the Canadian herd.

All tests required by a country importing swine from Canada are performed by Agriculture Canada's veterinarians, or practicing veterinarians accredited by the department, with samples and specimens tested only at an Agriculture Canada laboratory.

This painstaking application of modern veterinary science enables the most discriminating importers to buy from the Candian herd with complete confidence in the health of their purchases.

Performance Testing

Swine testing in Canada was inaugurated in 1928. Since 1937, the industry has had access to a uniform national station testing system that provides breeders with a sound basis for the assessment of their breeding stock. This system is known as the National Record of Performance (ROP) Swine Testing Program. The program consists of three parts: station testing, home performance testing and sow productivity.

The program is voluntary; however, it is virtually impossible in Canada today to sell a purebred breeding animal without performance records. At present, all of the Canadian purebred herds are in the testing program.

A. Station Testing

Station testing is carried out in one of seven Agriculture Canada test stations throughout Canada. These test stations are operated and managed solely by Agriculture Canada employees and all stations are operated in the same manner and style of management. This uniformity provides the opportunity to compare results on a national basis.

Station testing is designed to assess boar performance and determine his comparative merit. Two litter mates are sent to a test station and are fed a standard pre-test ration until they reach an approximate average weight of 30 kg, at which time they enter the test. The two litter mates (penned together on concrete flooring) are then put on a nationally standardized test ration — eating and drinking at will from self-feeding and self-watering containers in each pen.

1983
Station Tested Boar Performance Summaries
National Breed Averages

BREED	NO. BOAR	ADJUSTED AGE	ADJUSTED AVERAGE BACKFAT	AVERAGE DAILY GAIN	FEED CONSUMED PER KG LIVE GAIN
Yorkshire	1851	152	13.3	0.85	2.54
Landrace	1268	152	13.5	0.83	2.62
Lacombe	124	143	15.6	0.91	2.50
Hampshire	147	157	12.1	0.84	2.55
Duroc Jersey	334	153	13.2	0.82	2.55
Commercial	61	153	12.3	0.82	2.56
Spot	72	156	13.7	0.81	2.74
TOTAL Boars	3857				

The objective is to develop, without elaborate feeding, the kind of animal that performs well and produces a desirable carcass under commercial conditions. The test ends when the litter mates reach an approximate average weight of 90 kg.

Test results are presented in a report containing the following information:

(**1**) owners name and address;
(**2**) identity of sire;
(**3**) identity of dam;
(**4**) identity of individual test animal;
(**5**) average daily gain (ADG) on test;
(**6**) age adjusted to 90 kg live weight;
(**7**) backfat thickness measured ultrasonically and adjusted to 90 kg live weight;
(**8**) feed consumed per 1 kg live gain;
(**9**) index of boar — the boar is ranked within the breed using a 12 month rolling average.

Before the boar is allowed to re-enter the domestic herd, he must attain an index of 100 or better (based on a rolling 12 month index of the breed), be of good type, free of physical defects and test negatively to PSS. Boars failing to meet any of these requirements are slaughtered. Those that do meet the requirements are either sold by auction or returned to the herd of origin.

B. Home Herd Testing

(1) Performance Testing

All breeders testing their stock in the government test stations must also carry out the home herd test. Testing of all potential breeding stock (boars and gilts) must be submitted by the breeder, for weighing and backfat measurement, to ensure proper comparisons. The program is jointly administered by federal and provincial departments of agriculture. Breeders are visited on a regular basis by a provincial government swine technician who weighs boars and gilts and ultrasonically measures backfat thickness. The traits evaluated are adjusted backfat to 90 kg live weight, adjusted age to 90 kg live weight and average daily gain. The program is standardized across Canada.

Agriculture Canada enters the home test data on computer and issues reports to the breeder every three months, listing the following information:

(**a**) average weight of litter for each parent probed, recorded by sire and dam with breed indicated;

Weighing and probing for home test

(**b**) updated sire averages by breed listing the number of progenies tested and their averages;
(**c**) herd averages of all animals tested during the three-month period;
(**d**) estimated sire breeding value. This information for particular sires will soon be available from Agriculture Canada. Careful recording of the performance of offspring in various herds will provide the data to compare the estimated breeding values of specific sires.

(2) Productivity Testing
In 1984, Agriculture Canada implemented a sow productivity and management program. It is designed to evaluate litter size and assess the productivity value of the sow. The evaluation is based on the total weaning weight of the litter but also takes into account the number weaned.

1983 Comparison of Breed and National Average within Sex

Females

BREED	NUMBER	FAT	DEV.	MIN.-MAX.	AGE	DEV.	MIN.-MAX.
Yorkshire	23,479	14.2	2.6	6.1-29.7	168	16.9	99-255
Landrace	18,944	14.6	2.5	6.5-28.1	166	17.0	112-261
Lacombe	2,041	15.0	1.8	9.7-24.0	169	17.6	113-246
Hampshire	2,033	12.8	1.9	7.3-21.3	171	16.1	127-233
Duroc	3,295	14.4	2.5	8.0-24.4	165	15.8	125-250
Commercial	38,450	15.3	2.7	6.2-32.4	174	18.3	104-272
Berkshire	11	12.0	1.0	10.1-13.2	164	11.4	146-186
Spot	367	13.7	2.0	8.9-20.5	167	13.9	138-222
Managra	326	13.9	1.8	9.0-19.5	164	7.9	145-186
Newfoundland	210	20.5	1.6	16.0-24.9	170	9.6	145-194
Canada	**89,156**	**14.8**	**2.7**	**6.1-32.4**	**171**	**17.9**	**99-272**

Males

Yorkshire	12,966	13.0	2.4	5.4-24.6	161	17.6	103-258
Landrace	10,384	13.7	2.3	5.8-25.7	158	16.7	114-258
Lacombe	1,843	14.1	1.6	8.6-21.0	166	18.9	116-248
Hampshire	2,274	11.9	1.7	5.8-19.7	164	17.1	121-247
Duroc	3,010	13.1	2.2	6.9-23.2	160	15.2	114-224
Commercial	5,299	13.1	2.4	6.1-25.2	157	16.3	121-239
Berkshire	51	11.5	1.4	8.5-15.5	162	10.7	135-178
Spot	318	12.9	1.6	8.2-20.6	164	15.1	133-237
Managra	202	12.7	1.5	9.1-17.7	154	7.6	136-173
Newfoundland	89	19.6	1.7	7.7-24.1	164	10.9	142-199
Canada	**36,436**	**13.2**	**2.3**	**5.4-25.7**	**161**	**17.1**	**103-258**

Dev. — Standard Deviation

Artificial Insemination

The use of artificial insemination has expanded within Canada in recent years. Current practice is to utilize fresh semen but frozen semen is available. Although artificial insemination is not commonplace it is expected to become an integral part of a breeding program as breeders become more familiar with handling techniques. Embryo transfer is another reproduction method on the horizon.

Steps to Success

A successful commercial swine operation depends on:

(a) the use of high performance foundation stock selecting the best animals the breeder can afford;

(b) ensuring that the foundation stock and offspring are kept free of disease;

(c) providing proper nutrition in the feed;

(d) choosing the grandparent stock in the cross-breeding program with care and picking the best in the litter for subsequent breeding.

Freedom from Disease

Freedom from animal disease is essential to the efficient production of meat. In the swine industry it is particularly important because of the intensive production. Close association of large numbers of animals, the arrangement of buildings, the flow of inputs, the disposal of waste, day-to-day sanitation and the introduction of breeding stock, all require careful attention. Modern production facilities lend themselves to a rapid spread of any disease introduced into the herd. It is important to ensure the stock you purchase is free from disease.

Nutrition

In most countries with livestock industries there is now an adequate understanding of the nutritional requirements of meat animals but often some difficulty is encountered in adopting and correctly supplementing basic feed supplies to achieve maximum conversion efficiency. Hence the importance of accurate analysis and correct ration formulation. Feed supply is the largest single cost item of the enterprise and therefore, requires expert attention. Quality breeding stock develop their utmost potential on quality feed with a consistent nutritional value designed to meet their requirements.

Grandparent Stock

Success in cross-breeding demands that the level of efficiency achieved with crossbred offspring be higher than that of purebred offspring. It is essential to select with great care the grandparent lines used in the breeding program. Performance testing should be carried out consistently on individual progeny to identify the best animals for cross-breeding. It is important of course, for the quality of the herd to avoid excessive inbreeding. The breeder should periodically select from outside his herd to acquire new bloodlines.

Total Program Approach

The Canadian swine industry which is among the most successful in the world offers its expertise to:

(**a**) provide healthy breeding stock with the desired growth performance, feed efficiency and carcass leanness;
(**b**) help set up commercial swine enterprise to ensure proper health care and nutrition of swine and the best selection of animals for cross-breeding;
(**c**) manage the swine operation;
(**d**) offer technical advice to solve existing swine herd problems.

Canadian companies basically provide management procedures, feeding systems, building layouts, waste disposal systems and grandparent replacement stock. They plan the entire enterprise in accordance with market demand. Some outstanding results to date indicate that this total approach program is successful. The swine herd in Cuba, for example, is essentially totally Canadian.

Trade Services

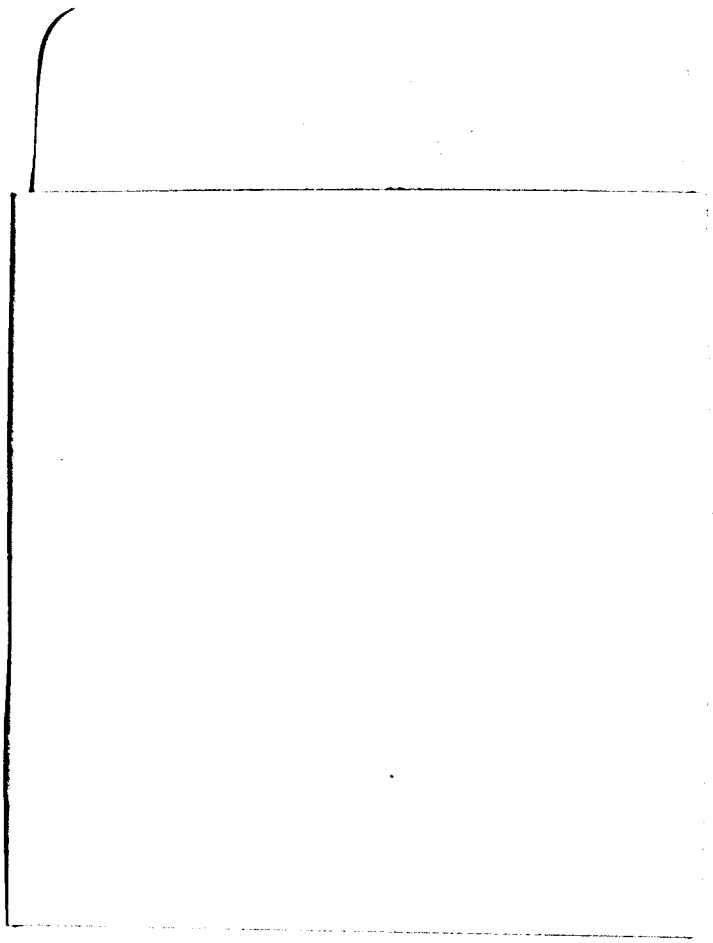
In recent years, Canada has exported swine to Britain, the United States, Hong Kong, Malaysia, Japan, Denmark, the Philippines, Singapore, New Zealand, Australia, Bermuda, Cuba, Trinidad-and-Tobago, the Dominican Republic, Puerto Rico, Saint-Pierre-et-Miquelon, El Salvador, Costa Rica, Colombia, Venezuela, Mexico, Greece, Italy, Sweden, the Federal Republic of Germany, East Germany, Czechoslovakia, South Africa, Zimbabwe, South Korea, Taiwan and Haiti.

Canadian government trade representatives are located at all Canadian embassies and high commissions throughout the world. These officers welcome enquiries and are prepared to offer sound advice on trade facilities, recommend contacts within the Canadian swine industry and make travel arrangements.

The centres of Canada's swine industry are serviced regularly by international airlines. Arrangements can be made through the trade officers to have competent export representatives meet buyers and visitors and plan itineraries to suit their needs. Interpreters can be provided when required.

International banking and insurance facilities, animal health inspection services and swine transport and documentation services are all immediately available. Canadian exporters are experienced in moving swine to international markets.


Canada
Farming Areas
Forest
Tundra
YUKON
NORTHWEST TERRITORIES
BRITISH COLUMBIA
ALBERTA
SASKATCHEWAN
MANITOBA
ONTARIO
QUEBEC
NEWFOUNDLAND
P.E.I.
NOVA SCOTIA
NEW BRUNSWICK



For further information about the Canadian swine industry, please contact:

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Canada