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Sire Differences and Pig Performance

J. W. McCarty

Boar replacements for the breeding herd are usually chosen as young untried animals. Where practical, further selection is more accurate among tried sires with data on their progeny. Just as boars, as growing pigs, differ in their performance so do groups of progeny sired by different boars. Having several progeny by each boar and out of several dams gives a good estimate of the boar's breeding ability.

Progeny data is the only way of evaluating boars for carcass characteristics. To indicate the variation that occurs among groups of progeny by different sires, there is in table form below a summary of carcass information for the experimental swine breeding herd for the 1958 spring season. In this herd all litters were farrowed in central facilities. Sows and litters were moved to brome-alfalfa pasture as soon after farrowing as possible in groups of 5 to 8 litters. At the 56 day weaning age, the sows were removed from pasture lots. Pigs were finished to desirable market weights in the same lot. Management and rations used are according to current recommendations. Pigs were self-fed a complete ground-mixed ration including yellow corn, oats, protein supplement and an antibiotic. Pigs were slaughtered the day following weighing out of their growing-finishing lot. All Durocs and Hampshires were inbred, while Yorkshires were crosses of inbred lines.

Table 1. Summary by Sires of Carcass Data 1958 Spring - Experimental Swine Breeding Herd^{1/}

Breed	Sire No.	Number Carcasses	Market Age, Days	Market Weight Pounds	Carcass Length, Inches	Backfat Thickness, Inches	Loin Eye, Sq. In.
Duroc	41	10	181	212	29.6	1.65	3.46
	42	4	192	212	29.8	1.68	3.52
	334	2	209	216	30.4	1.43	3.33
	341	14	165	214	28.9	1.71	2.98
	Breed Average	30	177	213	29.4	1.67	3.23
Hampshire	22	1	170	223	30.1	1.60	4.73
	193	15	178	211	29.0	1.76	3.62
	282	9	171	217	29.8	1.52	3.86
	320	9	179	220	29.2	1.75	3.95
	350	7	173	208	28.6	1.73	3.83
	351	2	193	204	28.0	1.80	3.76
	Breed Average	43	176	214	29.1	1.70	3.80
Yorkshire	51	9	194	210	30.3	1.52	3.73
	160	2	147	202	29.1	1.62	4.18
	399	12	171	213	30.7	1.65	3.81
	120	11	180	217	31.4	1.71	3.57
	221	8	178	212	30.9	1.66	3.92
	133	2	176	203	30.0	1.67	3.96
	313	1	158	196	30.0	1.30	3.57
	332	4	166	210	29.6	1.82	3.54
	Breed Average	49	177	212	30.6	1.65	3.74

^{1/} Carcass data collected in cooperation with Hormel and Company, Mitchell, S. Dak.

Records such as these might be confusing. There are no consistently outstanding records for any boar in all characteristics. However, the information can be useful in selecting replacements. Some of these sires' progeny would not be used at all on the basis of the records. For example, one would be hesitant to use pigs by Duroc boar 341 because of the small average loin eye area.

Evident in these data, as well as any data used for selection purposes, is the variability. This variability makes selection possible. As with all variation, part is due to genetic differences and part to all other non-genetic differences affecting animals. That part of the observed variation caused by differences in heredity is called heritability. It is the heritable part in which we are interested. This is the part which can be used for selection purposes.

Heritabilities are expressed as numerical estimates, which define that percentage of the observed variation due to genetic differences. High estimates mean much genetic variation and large selection opportunities. Low estimates indicate limited selection opportunities for the specific character. In table 2 are presented heritability estimates for the characteristics for which data are presented in table 1.

Table 2. Some heritability estimates for growth and carcass characters of swine.

Character	Heritability Estimate %
Weight of pig at approximately 5 - 6 months	30
Carcass length	59
Thickness of backfat	49
Loin eye (area)	48

The above estimates, especially those for carcass traits, are considered high enough that there should be rather rapid response to selection. An example in using the estimate can be worked out for backfat thickness. This character is almost 50 per cent heritable. If you are able to save for breeding animals which have .3 inch less backfat than the average of all from which they were chosen, you should realize almost .15 inch reduction in backfat in the next pig crop.

Using the kind of information presented here might be useful in at least two ways in a breeding program:

1. choosing among tried boars which will be used further, and
2. choosing replacement animals not only on their own performance but also on the performance within or among sire groups--that is, the better individuals in the better sire groups.