committed themselves to goals of measurable genetic improvement are reminded of their challenge and progress each time a certificate is issued or transferred. Purchasers of seedstock have documented proof of the selection pressure effort that went into the production of each genetic package.

There is no doubt that the survival of some breeders and their breeds could depend on the decisions their leaders must make in the very near future. Many of those leaders are present here. Leadership is influencing the thoughts and feelings of others. Leaders must understand the followers, the followers do not have to understand the leaders. Our leaders need to decide how badly this industry needs changes and the effort we must invest for those changes to occur.

UTILIZING PERFORMANCE PEDIGREES

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Production Traits

<u>rate</u>, <u>efficiency</u> and <u>composition</u> of gain

Production traits can be measured directly on pigs selected for breeding. The advantage of performance data on ancestors in the pedigree must therefore be viewed as additional information above and beyond the performance data of the individual. There are two guidelines that are helpful in a general consideration of pedigree data. They are:

1. The value of pedigree information is reduced by one half for each additional generation separating the individual from the pedigree record.
2. Pedigree information adds little accuracy to the estimation of the breeding value of the individual once reliable information exists on the performance of the individual.

A failure to recognize these two guidelines results in a gross overestimation of the value of data in pedigrees. This overestimation is so common and so serious that any group considering wide use of pedigree data should carefully evaluate their program to ensure that it is not misleading.

Reproductive Traits

Reproductive traits on the individuals cannot be effectively measured until after initial selection and mating. There is, therefore, some merit in making initial selections based on pedigree data Even here, however, there is a tendency to overrate the value of the data present, particularly when looking at so called sow lines.

Some Principles to Consider in Recording Pedigree Performance Data

Show data only as a deviation from a valid contemporary.

Show data in terms of its contribution to either breeding value or transmitting ability.

3. Show data as its relative worth at its position in the pedigree.

The data that emerges from performance pedigrees on sow productivity, at least in the short term, is likely to be restricted to the female side of the pedigree. The values associated with such data depending on the form of reporting is set out in Table 1. The pertinent feature of Table 1 is the wide discrepancy between actual litter size data in an extended pedigree and the value of this data in making a decision. Most pedigree data is of little value. Yet, if presented in a pedigree, particularly in its raw form, it can have a most meaningful impact on decision making.

There is probably no more effective way to misguide, mislead and misinform an industry than by the provision of raw data on extended pedigrees. Before any group sets out on a large scale program of extended performance pedigrees, it should seriously examine and study the issues involved. The use of data on extended pedigrees can result in large amounts of wasted selection effort. It is said, only partly with tongue in cheek, that an industry might be better advised to burn its pedigrees than to extend them with performance data.

Almost every herd has its so-called "sow lines" that appear to have superior performance. An examination of the history of such lines usually reveals that the line as a whole is not superior. What has happened is that the individuals above average have been recorded. The herd over the long run has performed at the average. However, only those individuals above average have been recorded in the form of extended pedigrees.

Consider, for example, a ten sow herd. One of these sows will be expected to be superior to all others, will produce more litters, and contribute more gilts to the herd. Let us assume she contributes ten. These gilts on average perform at average levels. One, however, will be superior to all others and will therefore contribute more offspring to the herd which on average will perform at the average. Thus the process continues. We have a herd that consistently performs at the average. However, within that herd is an apparent "sow line" with substantial superiority. A more careful examination, however, indicates that the superiority is not associated with the line as a whole. It is only associated with those whose pedigrees have been extended. This has led many breeders to believe they truly have "foundation sows" that have generated a superior "female line". In point of fact, all that has happened is that successes have been recorded and failures ignored. Unfortunately, the transmitting ability of the successes have been zero.

The Real Reason for Recording Sow Productivity

The real reason for recording sow productivity is to provide a within herd management record. This record can be meaningful in culling decisions and, more importantly, in management analyses to determine where the herd as a whole is succeeding and failing. Such a management analysis permits the manager to concentrate on strengths and weaknesses in management with the objective of raising the productivity of the herd as a whole. Genetic improvement is secondary to the whole exercise. Ultimately it will become a goal; but before this happens, we have to better unravel the complex interrelationships that exist in the time sequence of events that make up the complex sow productivity (Figure 1). In addition to this, we have to learn how to manage herds such that consistently high levels of sow productivity are attained.

Sow Productivity

Sow productivity is defined as a combination of

1. pigs weaned per litter
2. litters weaned per year
3. weight and uniformity of pigs weaned

The important issue today is to achieve a management system that provides reasonable levels of performance in each of these traits. To do this, a record system must exist that permits an analysis of productivity. It is the analysis of productivity and the subsequent management decisions made as a result of this analysis that provides the immediate and important opportunity for improved efficiency. To the extent that our sow recording programs create this environment they can make a tremendous and most useful contribution to increased sow productivity. The minute we take this information, however, and put it into a direct genetic connotation as data, particularly the raw data, in an extended pedigree we may well be both misrepresenting the data and misleading ourselves.

At this stage of the art and science of achieving success in sow productivity, it is a management-health-physiology challenge. The contribution that can be made by genetics is not yet established. Nonetheless, recording programs that evolve out of genetic programs can be most useful in providing the objective base for analyses of and the revision of our management-health programs. There is a need to have a proper perspective. The wisdom of expending selection pressure for sow productivity on herds that are producing at the level of 12 to 14 pigs/sow/year should perhaps be questioned. Surely such herds have greater first priorities. This is not to condemn the emerging and established sow productivity programs. They can have a most meaningful and positive spin-off. Their contributions at this stage, however, are not likely to be in generating data for extended performance pedigrees.

Once we have established management skills that permit us to consistently produce at high levels of sow productivity, then we will be in a position to establish data banks on pedigree data that may be useful in estimating breeding values. Such data could then prove useful in forward planning breeding programs, through the use of A.I. and planned matings. There never has been and never will be any useful place in any livestock breeding fraternity for extended performance pedigrees based on original production data.

Table 1. Alternative Ways of Displaying Pedigree Data on Sows

	Weaned litter size of the litter in which the individual was born and reared			
	Individual	Dam	Grand Dam	Great Grand Dam
1. Litter size	12	12	12	12
2. Deviations (S)	+4	+4	+4	+4
3. Breeding value (Bv)	+.4	+.4	+.4	+.4
Pedigree value				
4. a) Independent	+.1	+.05	+.025	+.0125
5. b) Additional	+.1	.045	.015	.005

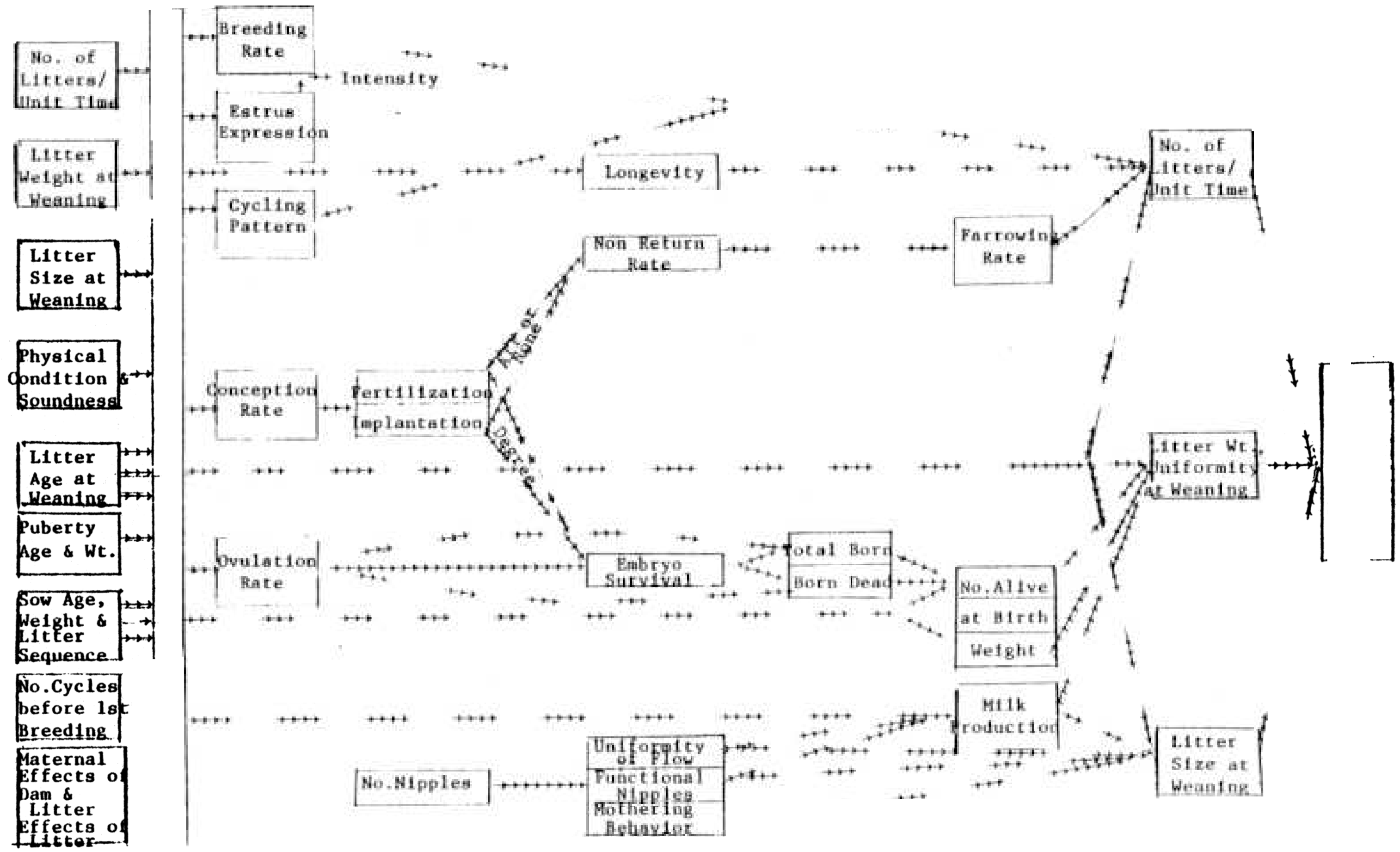
Average litter size = 8 h^2 =

Breeding value = Bv = h^2S

Pedigree value = transmitting ability = $a_1 \times a_2 \times Bv = \frac{1}{2} \times \frac{1}{2} \times h^2$

Where $a_1 = \frac{1}{2}$ because the individual transmits only a sample half of its genes.

$a_2 = \frac{1}{2}$ because litter size is a record of the dam of the individual rather than a record of the individual



No. of Litters/ Unit Time
Litter Weight at Weaning
Litter Size at Weaning
Physical Condition & Soundness
Litter Age at Weaning
Puberty Age & Wt.
Sow Age, Weight & Litter Sequence
No.Cycles before 1st Breeding
Maternal Effects of Dam & Litter Effects of Litter
Breeding Rate
Intensity
Estrus Expression
Cycling Pattern
Conception Rate
Fertilization
Implantation
All or None
Degree
Ovulation Rate
No.Nipples
Longevity
Non Return Rate
Embryo Survival
Uniformity of Flow
Functional Nipples
Mothering Behavior
Total Born
Born Dead
Farrowing Rate
No.Alive at Birth
Weight
Milk Production
No. of Litters/ Unit Time
Litter Wt. Uniformity at Weaning
Litter Size at Weaning

Traits	Theoretical		Obtain					
ar	8 litters/sow		6 litters/sow		4 litters/sow			
ys on to the onset	f x Days = Total Days	%	f x Days= Total Days	%	f x Days= Total Days	%	f x Days = Total Days	%
	x =		x =		x =		x =	
Onset of breeding to 1st mating	x =		x =		x =		x =	
Rebreeding sows	x =		x =		x =		x =	
Gestation	x =		x =		x =		x =	
Nursing	x =		x =		x =		x =	
Non-Productive Days								
.Days over 7 to rebreed sows	x =		x =		x =		x =	
.Days over 10 to breed gilts	x =		x =		x =		x =	
.Recycle 18 days or less	x =		x =		x =		x =	
. 19 to 23 days	x =		x =		x =		x =	
. 24 to 36 days	x =		x =		x =		x =	
. 37 to 46 days	x =		x =		x =		x =	
. 47 days +	x =		x =		x =		x =	
.Failure to cycle and breed	x =		x =		x =		x =	
.Failure to farrow	x =		x =		x =		x =	
.Abortion	x =		x =		x =		x =	
Questionable Days								
.Days nursing in excess of 3 weeks	x =		x =		x =		x =	
. Planned delay in initial breeding of gilts	x =		x =		x =		x =	
itter size - birth								
- alive	pigs/sow/yr		pigs/sow/yr		pigs/sow/yr		pigs/sow/yr	
- one week	born wean		born wean		born wean		born wean	
- three weeks								
Litter & Pig Wt. 3 wks.Litter								
Pig								
Range in 3 wk.pig wt.								
Productivity Index of s/litter, litter/year) litters)								