

Short Communication

REPRODUCTIVE LIFETIME OF SOWS IN RELATION TO ECONOMY OF PRODUCTION

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ABSTRACT

Kroes, Y., and Van Male, J.P., 1979. Reproductive lifetime of sows in relation to economy of production. *Livest. Prod. Sci.*, 6: 179–183.

In pig production substantial economic loss is involved in early culling of sows, due to low fertility, leg problems, etc. Data on 15 000 services from 85 commercial pig farms were analysed to quantify the importance of these losses. From the average cost price per weaner per litter and cumulative, a "sow remainder productive life value" has been calculated, indicating the economic loss when a sow has to be culled too early. Calculations for farms with low, average and high culling rates show substantial differences in economic results.

INTRODUCTION

Accurate and reliable figures on sow productivity are very difficult to obtain, partly because of the large influence of management, in the broadest sense of the word. This may have been why the subject has received insufficient attention despite its economic importance. This paper deals in particular with the influence of productive lifetime on number of weaners per sow per year.

MATERIALS AND METHODS

Detailed data were available from the Dutch National Agricultural Advisory Service and the Agricultural Economic Research Institute (L.E.I.) concerning 15 000 services on 85 commercial farms. On average the sows produced 1.97 litter per annum and the average replacement rate was 43%. Loss rates in piglets have been derived from the literature (Hoornweg and Dröge, 1967; Rasbeck, 1969; Strang, 1970; Varkensproefbedrijf, 1974). More detailed figures are given in Table I.

CALCULATIONS

Starting from these data, and using standard costs for new buildings as used by the L.E.I., we calculated the cost price per weaner in consecutive litters, and the cumulative cost price. From this we calculated the "remainder productive

TABLE I

Average culling rates and production at consecutive litters

Litter number	%%	Culling rate		Weaners per litter		
		Between service and indicated litter (empty, abortion, etc.)	Between farrowing from indicated litter and next service	Total	Born alive	Reared
1	19.6	4.77	3.04	9.7	9.2	7.8
2	16.3	3.47	2.60	10.7	10.2	8.9
3	13.8	2.27	2.07	11.2	10.6	9.0
4	11.6	2.16	1.31	11.3	10.8	9.1
5	9.9	2.16	0.87	11.4	10.7	8.9
6	8.6	1.74	1.73	11.4	10.8	8.9
7	7.0	1.30	2.17	11.6	10.8	8.8
8	5.3	1.30	1.74	11.4	10.7	8.6
9	3.7	1.30	1.70	11.9	10.9	8.6
10 etc.	4.2	1.30	4.37	12.5	11.0	8.6
Total	100	21.77	21.60	10.99	10.36	8.68
Average						

life value", an indication of the expected profit per sow in the remainder of her productive life, assuming a weaner price of Dfl. 115 at 22 kg. These data are summarized in Table II. This indicates, not surprisingly, that the cost price per weaner is highest in the first litter and decreases over the next two litters. The cumulative cost price is at its minimum with the seventh litter.

The remainder life value reflects the expectations per individual sow for its further productivity. If a sow, for whatever reason, has to be culled directly after weaning, the damage is equal to the remainder life value. If she is culled at a later stage in the reproductive cycle, there is an additional damage equal to the costs of housing and maintenance during the non-productive days (Dfl. 4 per day).

The above figures are averages over 85 farms and provide no information on variation and its consequences. In order to analyse the influence of length of productive life on productivity we specified two other groups, viz. with a low and high rate of replacement, respectively. To these two groups model calculations were applied which are based on factual, but not extreme, figures from the same commercial farms. Some main averages are given in Table III.

The culling rate has a great impact on the composition of the sow herd. Assuming that any culled sow is immediately replaced by a new gilt we can calculate the distribution of the first and consecutive farrowings, which is also given in Table III.

The first and second farrowings, generally connected with more problems than the next ones, increase from 26.8% for the low culling group via 35.9% for the average to 44% for the high culling group. Taking into account that

about 50% of the cullings take place during (expected) gestation and often at a very late stage, the farrowing interval increases in fact by 6—8 days from the first group to the average group, and by another 6—8 days from the average group to the high culling rate group.

Combining all data, we can summarize the results as given in Table IV.

TABLE II

Average cost price and sow values at consecutive litters

Litter number	Cost price per piglet (Dfl)		Sow value before service of indicated litter	
	In litter	Cumulative	Slaughter	Remainder life
1	135.37	135.37	365	58
2	109.77	122.92	344	212
3	101.64	116.64	344	230
4	102.34	113.75	387	167
5	105.81	112.63	420	98
6	106.22	111.93	440	60
7	109.51	111.73	457	18
8	112.12	111.75	457	—
9	114.36	112.01	449	—
10 etc.	113.52	111.92	446	—

TABLE III

Litters per sow, replacement rates and distribution of farrowings in three groups of farms

Groups of farms with:	Low culling rate	Average culling rate	High culling rate
Litters per sow during her entire productive life	6.56	4.55	3.42
Replacement per year (%)	31.3	43.4	55.4
Distribution of farrowings (%) according to litter number	1	14.1	25.0
	2	12.7	19.0
	3	11.8	14.8
	4	10.6	11.6
	5	9.5	9.2
	6	8.8	7.5
	7	7.9	5.6
	8	6.6	3.7
	9	5.3	2.3
	10 etc.	12.7	4.2

TABLE IV

Summary of results in three groups of farms

Groups of farms with:	Low culling rate	Average culling rate	High culling rate
Litters per sow per year	2.06	1.97	1.89
Weaners per sow per year	17.9	17.1	16.4
Cost price per weaner (Dfl.)	108.05	111.91	116.12
Labour income per sow (Dfl.)*	556.00	485.00	413.00

* Labour income = all income minus all costs excluding labour.

CONCLUSIONS

— The differences in economic results between farms with different culling rates are substantial. A difference of Dfl. 143 per productive sow per year was calculated between groups with low and high culling rates.

— In practice these differences may be even greater because of the possible interaction with general management.

— High culling rates and the difficulty of the immediate replacement of culled animals will lead to a sub-optimal sow population, with an additional negative economic effect.

— High culling rates necessitate many replacement animals which, if purchased, will give an additional health risk.

The economic importance of productive life is such that further study of the causes of variation and the possibilities for improvement is fully justified.

REFERENCES

- Hoornweg, J. and Dröge, H., 1967. *Bedrijfseconomische beschouwingen over fokkerij en mesterij. Varkens 1968*. Landbouw Economisch Instituut, Den Haag, No. 198, pp. 28–29.
- Rasbeck, N.O., 1969. A review of the causes of reproductive failure in swine. *Br. Vet. J.* 125: 599–616.
- Strang, G.S., 1970. Litter productivity in Large White Pigs. I. The relative importance of some sources of variation. *Anim. Prod.*, 12: 225–233.
- Varkensproefbedrijf "Noord- en Oost-Nederland", 1974. *Jaarverslag*, p. 12.

RESUME

Kroes, Y. et Van Male, J.P., 1979. La vie productive des truies: aspects économiques. *Livest. Prod. Sci.*, 6: 179–183 (en anglais).

La réforme prématurée des truies à cause de fertilité insuffisante ou de défauts entraîne de grandes pertes économiques. On a étudié les données enregistrées de 85 exploitations

porcines portant sur 15 000 saillies, pour quantifier ces pertes. On a calculé le prix de revient des porcelets par numéro de portée et pour l'ensemble cumulé des portées, pour y dériver la valeur de la truie pour la reproduction. La différence avec la valeur bouchère de la truie indique la perte à cause de réforme prématurée. Les résultats économiques calculés pour les fermes ayant un taux de réforme faible, moyenne et élevé montrent des différences considérables.

KURZFASSUNG

Kroes, Y. und Van Male, J.P., 1979. Die produktive Lebensdauer von Sauen: Ökonomische Aspekte. *Livest. Prod. Sci.*, 6: 179–183 (in Englisch).

In der Schweineproduktion treten grosse wirtschaftlichen Verluste auf durch Ausfall von Sauen wegen Fruchtbarkeitsstörungen, Beinschwäche usw. Um die Bedeutung dieser Verluste zu quantifizieren wurden Daten von 15 000 Belegungen in 85 Betrieben analysiert. Mittels den errechneten Erzeugungskosten der Ferkel pro Wurfnummer und kumulativ über mehreren Würfen wurden die ökonomischen Differenzen zwischen dem Schlachtwert und dem Wert als Zuchtsau errechnet. Durchgeführte Berechnungen für Betriebe mit niedrigen, durchschnittlichen und hohen Ausmerzquoten zeigen erhebliche wirtschaftlichen Unterschiede.