



FACTORS AFFECTING SOW AND GILT EFFICIENCY IN  
COMMERCIAL PIGGERIES IN ZAMBIA



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by

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## DECLARATION

I hereby declare that this thesis does not contain any material previously submitted for the award of any other degree or diploma in any university and that, to the best of my knowledge, the thesis contains no material previously published or written by any other person, except where reference is made in the text. I declare that all work in this thesis was carried out by myself, except where stated in the text.

I consent to this thesis being made available for photocopying and loan if accepted for the award of the degree.

Sally Crafter

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## ABBREVIATIONS

CD	cold-dry season
cdw	cold dressed weight
<i>E. coli</i>	<i>Escherichia coli</i>
GRZ	Government of the Republic of Zambia
FCR	feed conversion ratio
FAO	Food & Agriculture Organisation
FI	farrowing index
H&E	Haemotoxylin and eosin
HD	hot-dry season
HW	hot-wet season
IMF	International Monetary Fund
kg	kilogram
LH	lutelinising hormone
LW	Large White
LR	Landrace
MAWD	Ministry of Agriculture and Water Development
n	number
n.s.	not significant
NA	not available
NMC	National Milling Company
SRC	sow record card
U.K.	United Kingdom
U.S.A.	United States of America

WCI        weaning to conception interval  
WM        warm-moist season  
WSI        weaning to service interval  
ZAPP       Zambia Pork Products

## SUMMARY

1. Zambia, a land locked country in Southern-Central Africa, achieved independence in 1965. At this time the United National Independence Party inherited a healthy economy based on the mining and export of copper. During 1975, copper prices dropped to below the cost of production. This had a marked affect on all agricultural industries as foreign exchange allocations to import agricultural chemicals, livestock, seeds and machinery were reduced. The pig industry in particular suffered from lack of investment and by the time this study commenced was plagued by low productivity and reducing profitability resulting in a loss of confidence in the industry.
2. This research resulted from the author's observation that many problems in animal production in Zambia were often due to ignorance of correct of management techniques and born of a general ignorance of the industry. Therefore the research was designed to look for simple answers to simple problems in the Zambian commercial pig industry. Due the logistical difficulties of working in a developing country it was designed to be a project that could be carried out in the third world and which did not involve reliance on sophisticated machinery or techniques.

3. At the time of commencement of the study there was no baseline data available on the pig industry of Zambia, therefore a survey of pig farmers was carried out to determine production levels, management techniques and areas of inefficiency in the commercial pig industry. Approximately 50% of identified piggeries were visited and piggery staff interviewed. A summary of the Zambian commercial pig industry was generated covering production parameters, management levels and identification of areas of major inefficiency. Estimated average production figures were 13.6 pigs weaned and 12 pigs sold/sow/year, a farrowing index of 1.7 litters/sow/year, preweaning mortality at 20% and grower feed conversion ratio of 4.7. Major problems with the industry were poorly designed farrowing pens, low quality and expensive feed, poor marketing, lack of good breeding stock and inadequate extension services.
4. Data from actual sow record cards was collected from three farms with reliable records. The estimate of overall productivity was 14.5 pigs weaned and 13.2 pigs sold /sow/year; farrowing index was 2.02 (weaning to conception interval = 18.3 days, gestation length = 115 days, lactation length = 46 days), 8.8 piglets were born alive and pre-weaning mortality was 21%. There was a discrepancy between the two surveys in farrowing index which was higher

and in litter size which was lower in the sow card survey. No seasonal infertility was established; gilts were found to have a lower fertility than sows.

5. An abattoir survey was used determine if physical abnormalities were the cause of the low productivity observed. This was the first such survey to be carried out in Zambia. Tracts of 139 female swine (107 finishers and 32 cull breeders) were collected from various abattoirs and examined for genital abnormalities, ovulation rate, reproductive status and bacterial contamination. The study found a high percentage of some congenital abnormalities but these were not thought to influence fertility. Overall, 13% of tracts were likely to be infertile. A bacteriological examination was carried out; organisms cultured were generally opportunistic and ubiquitous. A seasonal influence on puberty attainment was established.
  
6. A small on-farm experiment was carried out to assess the effect of translocation and partial boar exposure on the attainment of puberty in gilts. No treatment effect was seen but more stringent gilt management could be used by Zambian farmers to improve efficiency.

7. Analysis of the data collected has enabled a good estimate to be made of the actual position of the commercial pork industry in Zambia. Recommendations for the improved management of commercial pigs in Zambia were advanced.