

## II. — REPRODUCTION

**About sex ratio in pigs**

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Variations of sex ratio at birth were studied retrospectively (number of males [p. 100] relative to the total number of piglets) in our experimental farm.

The study concerned all sows mated between September 1st 1973 and October 30th, 1979 : 1 100 litters (11 537 piglets) born from 288 sows and 21 boars. Boars belonged to the *Large White* (LW) or *Belgian Landrace* (BL) breed. Sows belonged either to one of these two breeds or they were crossbreds (LW × BL). Piglets came from 4 genetic combinations : (1) ♀ LW × ♂ LW, (2) ♀ LW × ♂ BL, (3) ♀ BL × ♂ BL, (4) ♀ (LW × BL) × ♂ LW.

Combination (4) gave a significantly higher number of males. The lowest sex ratio was registered with combination (3).

The influence of the sow breed seemed to be higher than that of the boar.

Sex ratio was changed by the age of the boar.

The litters of sows at their second gestation showed a significantly lower sex ratio.

No clear difference seemed to be linked to the season or the moon stage.

The highest percentage of males was registered in the litters of 10 to 13 piglets.

An attempt to modify the mineral nutrition (reduction of the alkaline/alkaline-earth ratio) led to a decrease of the sex ratio in primiparous sows and on the contrary an increase of this ratio in sows with their second litter.

**New data on oestrus synchronization in the sow**

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The possibilities of using a progestagen RU2267 (Regumate), to control ovulation was tested in farms on nulliparous and multiparous sows.

In cyclic nulliparous sows the mode of feeding applied when offering Regumate (18 days of treatment, orally, 20 mg/d/0) affected the efficiency of the method : more accurate grouping of heats with individual feeding. The introduction of a boar when the treatment was stopped suppressed that effect : 95 p. 100 of the sows exhibited oestrus over a period of 72 hours (day 5-7), whatever the mode of feeding. Inseminations on predetermined days are thus possible. Fertility and prolificacy obtained after artificial insemination in connection with induced oestrus were 74.2 p. 100 and 9.5 piglets born alive, respectively

(n = 275). Increase in the number of spermatozoa ( $12.10^9$  spz/21A), improved fertility and litter size.

After drying off, a short Regumate treatment (3 days) was applied (starting on the day of weaning). Even in good management conditions, this treatment improved the synchronization of heats obtained after weaning. In primiparous females, whose return to oestrus after drying-off gives rise to most problems a marked improvement was noticed : 72 p. 100 of oestrus between day 5 and 7 post treatment versus 39 p. 100 in the controls. The farrowing rate after artificial insemination in connection with induced heats was comparable to that of the control sows. The dose of progestagen used (20 mg/d/sow) had no unfavourable effect on litter size, but this seemed to be the case with a higher dose.

### ***In vitro* study of some factors improving spermatozoa survival during long semen storage**

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Two experiments were carried out to determine the effect of the  $Na^+/K^+$  ratio of the extender and the effects of semen collection rhythm and rate of extension upon *in vitro* spermatozoa survival during a long storage. In the first experiment the  $Na^+/K^+$  ratios (50 - 5 - 0.5 - 0.05) were compared after 48 and 120 hours of preservation at + 15 °C. In the second experiment, we compared two spermatozoa concentrations ( $30$  and  $120 \times 10^6$  spz/ml) as well as two rhythms of collection (once or twice a week), after 1, 2, 3, 4 and 5 days of storage at + 15 °C.

An optimum  $Na^+/K^+$  ratio was determined for spermatozoa survival. This ratio, ranging between 0.5 and 5, corresponded to that observed in the fluid of the epididymal caudal region. This optimum was more marked after 5 than after 2 days of preservation.

A low dilution ( $120 \times 10^6$  spz./ml) as well as the rhythm of semen collection twice a week favoured the spermatozoa survival during a long storage.

### **Effect of the extender, rate of extension and seminal plasma or the fertility of sows after a long semen storage**

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Two experiments were made to test the efficiency of several factors in maintaining the fertilizing ability of spermatozoa after 5 days of preservation. Guelph and  $BL_1$  extenders were compared in the first experiment. In the second one (factorial  $2 \times 2$ ) the effects of two rates of extension ( $30$  and  $120 \times 10^6$  spermatozoa/ml) and of two fractions of ejaculates (total fraction and rich fraction), were studied. A total of 963 and 1 071 sows, respectively were inseminated once during oestrus in the first and in the second experiment.