samples reached almost 50 %. Isolated bacteria were mainly of faecal origin. The role of hygiene at semen collection is emphasized. As semen contamination may reduce fertility, periodical bacteriological examinations of semen are recommended.

Epididymal maturation of spermatozoa : effect on gamete quality

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The fertilizing capacity of spermatozoa develop during their transit through the epididymis. This organ possesses several functions located in well determined sites. Epididymal cells produce and secrete in the lumen of the tubule several compounds such as numerous specific proteins. They also concentrate substances such as carnitine. The role of this compound is still unknown but the increase in carnitine and acetylcarnitine concentration in spermatozoa is associated with an enhanced motility. This epithelium constitutes a barrier between blood circulation and the luminal content of the tubule so that spermatozoa bath in a fluid exhibiting a very specific composition. Spermatozoon maturation through epididymis is characterized by successive morphological and physiological changes affecting gametes in very precise regions of epididymis. Initiation of motility is related to the increase in the movement of flagellum during transit. The biochemical analysis of proteins from the surface of the spermatozoon membrane shows three major stages in gamete maturation : loss or masking effect of protein compounds on the surface of testicular spermatozoa and occurrence of transitory then definitive compounds characteristic of a fertilizing spermatozoon. The development of the epididymal function at puberty takes place progressively. Marked disorders in epididymal activity immediately lead to a reduced fertility of the animal. Small variations in the activity of this organ might probably cause differences in gamete quality between animals especially in their preservation capacity in the liquid or in the frozen state.

Patterns of circulating LH, FSH, prolactin and E_2 17 β in the gilt during the follicular phase of the oestrus cycle

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Blood samples were taken from 5 cyclic gilts every 15 minutes for 108 hours between days 15 and 18 of the oestrus cycle. Plasma concentrations of LH (luteinizing hormone), FSH (follicle stimulating hormone) and PRL (prolactin) were measured in the jugular vein and those of E_2 17 β (oestradiaol-17 β) in the utero-ovarian vein.

In the late follicular/early luteal phase (days 15 and 16), LH pulses were numerous and their frequency close to 1 per hour. This high secretion could be necessary to the preovulatory growth of follicles. PRL secretion was also high.

Thereafter, the basal level, frequency and amplitude of LH pulses decreased and remained low at least between − 36 and − 12 hours before the preovulatory LH surge. PRL and FSH concentrations also declined while those of E_2 17 β increased considerably. This increase in E_2 17 β levels probably induced the decline in the secretions of LH, FSH and PRL.

Surge of LH occurred during oestrus while E_2 17 β concentrations were still high. It lasted 13 to 20 hours and was accompanied by an increase in FSH and PRL secretion. While LH and PRL mean levels decreased, FSH concentrations were still increasing. Pulses of LH occurred again about 30 hours after the start of the LH surge.

During the period of oestrus, each exposure to the boar was immediately followed by a peak of PRL which could play a role in the behaviour of the gilt.

Use of ultrasound echography to study embryonic development in the sow

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Ultrasound echography (scanning) allows to visualize embryonic vesicles as early as 18 days after ovulation in the sow. Before, the allantoic and amniotic fluid volumes are too small and undetectable. The purpose of this study was to evaluate with accuracy the conceptus development (embryonic vesicles, embryos) in the first third of pregnancy in order to define the conditions of optimum utilization of this pregnancy diagnosis on the farm.

A total of 233 pregnant sows from 4 herds were scanned 6 times at intervals of 7 days from 21 ± 2 d post-insemination. All examinations were carried out by the same operator. The ultrasound scanner used was a TOSHIBA SAL 32 B. For each sow, images of the first three scannings were recorded with a video tape recorder. For each scanning, images were drawn after frame-freeze. This allowed measurement of the size of individual structures within an image : vertical diameter of surface (n = 6622) of vesicles, length (n = 253) or diameter (n = 585) of embryos.

A very rapid growth of vesicles was observed between 20 and 30 d. Their size (diameter of surface) was less variable. After 30 d growth was slower.

Embryos were visible from 21 d post-insemination. Between 21 and 37 d ($r = 0.97$) their growth was linear. Nevertheless between 21 and 30 d, images were easy to interprete due to the small size of embryos relative to the volume of fluid. It is therefore recommended to perform pregnancy diagnosis during this period. Prediction of the litter size by enumeration of vesicles at 3, 4 or 5 weeks is not possible, the calculated coefficients of correlation being too small (r : ranging between 0.16 and 0.27).

Pregnancy diagnosis by ultrasound echography : an aid to control pig reproduction

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In the sow, we have previously shown that ultrasound echography (scanning) can be an aid to the early diagnosis of pregnancy. This technique has been used since 1984 in about fifty herds.