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MORPHOLOGICAL FINDINGS ON REPRODUCTIVE ORGANS IN GILTS WITH PROLONGED PREPUBERTAL ANESTRUS[1]

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Abstract: Optimal age for gilt fertile insemination was 220 to 240 days. At one large industrial farm unit in Vojvodina, during October and November in year 2004, because of prolonged pre pubertal anestrus, 126 gilts were culled at average 266 days (242 to 358d) of age. All of the gilts wer sacrificed, for their reproductive organs laboratory examination. According to functional structures (pre ovulatory follicles, corpora hemorhagica, corpora lutea and corpora albicantia) present on their ovaries it was estimated: 42,9% of the gilts were cyclic (functional structures were found on their ovaries); 65,0% of cyclic gilts have one and 35,0% of gilts have two estrus cycles. Number of sexually mature gilts decreased with their age. Obtained results indicate considerable number of gilts with detected prolonged anestrus as a result of inadequate stimulation technology and/or estrus detection.

Key words: anestrus, delayed puberty, gilt.

Introduction

The gilt of modern breeds must be fertile inseminated in the second or third pubertal estrus, at the age of 220 to 240 days and about 130kg body weight, with minimum 18mm backfat thicknes. Such gilts produce maximal number of piglets in the whole period of their reproductive exploitation *(Spronk et al. 1997)*. However, the significant proportion of gilts (20 to 40%) doesn't express signs of first pubertal estrus (i.e. delayed puberty) not until 240 days of age *(Ehnvall et al. 1981).* In such cases it can be supposed that: (a) cyclic pubertal ovarian activity was not established, (b) silent estrus (ovulation without external signs of estrus) and (c) signs of estrus were not detected.

The aim of the present work was to determine the status of sexual maturation in gilts, culled from reproductive herd because of prolonged pubertal anestrus, according to findings on their reproductive organs after sacrificing.

Material and Methods

During the period October – November in year 2004, 126 gilts with prolonged anestrus were sacrificed at the age of 242 to 358 days (average 266d). The status of sexual maturation (pre pubertal or pubertal) was determined according to functional structures found on their ovaries.

As sexually immature (acyclic) - pre pubertal gilts were considered those with follicles on ovaries of only ≤ 5mm in diameter and no other functional structures were detected. As sexually mature (cyclic) - pubertal gilts were considered those with follicles on their ovaries of 6-7mm in diameter (proestrus) or 8-11mm (estrus pre ovulation), corpora hemorhagica –CH (metestrus) or corpora lutea – CL (diestrus). Ovaries with only large follicles, CH, or CL was determined as one pubertal estrus cycle. Ovaries with following combination: large follicles diameter of 6-7mm or 8-11mm + CL or CA (corpora albicantia), or CH + CA or were determined as two pubertal estrus cycles.

Results and discussion

Obtained results of the status of sexual maturation of sacrificed gilts are presented in table 1.

According to functional ovarian structure, 42,9% of 126 sacrificed gilts were sexually mature. With one estrus cycle there were 65% and with two estrus cycles there were 35% from the total number of sexually matured gilts (Table 1).

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Table 1. Sexual maturation status in gilts with delayed puberty

Sacrificed gilts (n)		126
Average age of gilts at sacrificing (days)		266 (242 – 358)
Prepubertal gilts, n (%)		72 (57,1%)
Pubertal gilts, n (%)	total	54 (42,9%)
	with one E-cycle	35 (65,0%)
	with two E-cycles	19 (35,0%)

Delayed puberty was determined if gilts not express signs of first pubertal estrus until 240 days of age *(Dalin, 1987)*. About 34% of gilts were culled because no signs of estrus until 9 months of age were displayed. However, in the 70% of these gilts, cyclic ovarian structure was found after sacrificing *(Ehnvall et al. 1981)*. In our previous investigations, 50% of gilts which were culled because of prolonged pre pubertal anestrus, had established cyclic ovarian activity *(Stančić et al. 1999)*. On the other hand, recent investigations demonstrated that relatively small number (5 to 10%) of pubertal gilts exhibit silent heat *(Andersson et al. 1982)*.

The effect of age of gilts at scarification on their sexual maturation established based on determined functional structures on their ovaries demonstrates that number of sexually mature gilts decreases with their age until they are culled from breeding due to prolonged anestrus (Table 2).

Table 2. The effect of age of gilts on their sexual maturation

		Age of gilts at sacrification (days)			Ukupno
		242-257	258-273	≥ 274	
Sacrificed gilts (n)		22	98	6	126
Average age of gilts at sacrificing (days)		252	268	295	266
Prepubertal gilts, n (%)		45,4	58,1	66,7	57,1
Pubertal gilts, n (%)	total	54,6	41,9	33,3	42,9
	with one E-cycle	33,3	75,0	50,0	65,0
	with two E-cycles	66,7	25,0	50,0	35,0

Results presented in table 2 show that considerably higher number (54,6%) of younger gilts (whose age is near to optimum, 240 days) have pubertal ovarial activity compared to older gilts (33,3%). Due to prolonged puberty, 30 to 40% of gilts older than 9 months are culled from breeding (Hoyt, 1998). This author stated that number of gilts with established cyclic ovarial activity decreases with age when first signs of pubertal estrus are registered. Similar results were obtained by *Dalin et al. (1997), Stančić et al. (1999), Trnjakov et al. (2005)*.

Obtained results in the present work, as well as findings of the other authors, clearly demonstrate that great proportion of gilts, defined as “delayed puberty” or “prolonged anestrus”, was the result of inadequate technology of estrus stimulation and/or detection.

Conclusion

According to findings of functional structures, on the ovaries of sacrificed gilts, culled because of delayed puberty, the following can be concluded:

1. Cyclic ovarian activity (puberty) was established in 42,9% of the total number of gilts, 65% with one estrus cycle and 35% with two puberty estrus cycles.
2. Diagnosed prolonged pre puberty anestrus in gilts with established cyclic ovarian activity is probably consequence of inadequate technology of estrus detection.
3. It was established that number of sexually mature gilts decreases with the age at which they were sacrificed.

MORFOLOŠKI NALAZI NA REPRODUKTIVNIM ORGANIMA NAZIMICA SA PROLONGIRANOM PREPUBERTETSKOM ANESTRIJOM

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Rezime

Optimalna starost nazimica kod fertilnog osemenjavanja iznosi 220 do 240 dana. Na jednoj velikoj industrijskoj farmi u Vojvodini, tokom oktobara i novembra meseca 2004. godine, zbog dugotrajne prepubrtetske anestrije, izlučeno je ukupno 126 nazimica, prosečne starosti 266 dana (od 242 do 358 d). Sve nazimice su žrtvovane, a njihovi polni organi su pregledani u laboratoriji. Na osnovu ustanovljenih funkcionalnih ovarijalnih struktura (predovulatorni folikuli, corpora hemorhagica, corpora lutea i corpora albicantia), ustanovljeno je sledeće: 42,9% nazimica je uspostavilo pubertetsku cikličnu ovarijalnu aktivnost, jer su, na njihovim jajnicima, ustanovljene funkcionalne (ciklične) ovarijalne struktura. Kod 65% nazimica je ustanovljen jedan, a kod 35% nazimica dva estrusna ciklusa. Broj polno zrelih nazimica se samnjuje sa povećanjem njihove starosti kod žrtvovanja. Dobijeni rezultati jasno pokazuju da je značajan broj broj nazimica sa detektovanom prolongiranom anestrijom, posledica neadekvatne tehnologije stimulacije i/ili otkrivanja estrusa.

Ključne reči: anestrus, prolongiran pubertet, nazimica.

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