

The anatomical structure of sow's udder – a different point of view^{*}

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Summary

The aim of this work was a fuller study of the anatomical structure of sows' udder with particular reference to the number of nipple glands, their distribution and size and the number of milk canals in each nipple.

A detailed evaluation of milk glands taken from 8 pbz x wbp sows right after slaughter on the last day of the second lactation was carried out. The obtained material was used to make corrosion preparations by filling milk canals with plastic. In total 83 corrosion preparations were made, unused nipples were disregarded. 2-canal glands were most numerous and 3-canal ones were found in all areas of the udder, i.e. in pectoral, abdominal and inguinal sections.

Following own observations, the authors are inclined to think that lactation of particular glands is determined primarily by their position and not by the number of milk canals. On the other hand, the area where SigA can be synthesized is determined by the number of milk canals. It seems that milk from nipples with higher number of canals can be richer in immunoglobulins and, consequently, can be not only a better nutritional agent but also a prophylactic measure in digestive system diseases.

Key words: sows, sow's udder, milk canals, milk yield

The research aimed at securing piglets correct growth at the time spent by mothers, comprises several problems with regard to: litter standardization in terms of number and sucklings' body weight to ensure an equal start at the commencement of rearing (Bil et al., 2000, Rzaśa et al., 2003), adequate feeding level of nursing sows (Rekiel 2001) and number of properly developed teats in the sow to let each piglet take a similar amount of milk.

It's been known for a long time that particular teats appeal in different ways to sucklings, the phenomenon conditioned by teat position, accessibility during feeding and its anatomical structure. Some authors (English et al., 1988, Rzaśa et al., 2003, Prociak et al., 2004) conducted observations and researches on such traits as the length, diameter and shape of teats, the distance between them and degree of exposure at feeding.

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The milk yield is one of the priority factors affecting the number and weight in reared piglets, hence many authors' interest in the subject (Rzaşa et al., 2003, Kim et al., 1999; Farmer et al. 1999; Czarnecki et al., 1991). The potential milk yield depends primarily on the environmental pressure, genetical assumptions and, consequently, structure and growth of the gland itself.

The aim of this work was a fuller study of the anatomical structure of sows udder with particular reference to the number of nipple glands, their distribution and size and the number of milk canals in each nipple.

Materials and methods

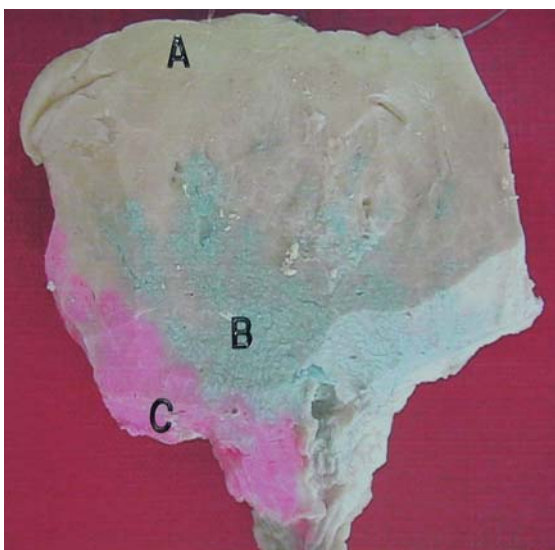
On the farrowing day all sows were surveyed with regard to their udder, in vivo determination of the number of milk canals was carried out on the basis of milk flowing during milking.

A detailed evaluation of milk glands taken from 8 pbz x wbp sows right after slaughter on the last day of the second lactation was carried out. The obtained material was used to make corrosion preparations by filling milk canals with plastic (Epidian 53). In total 83 corrosion preparations were made, unsucked nipples were disregarded.

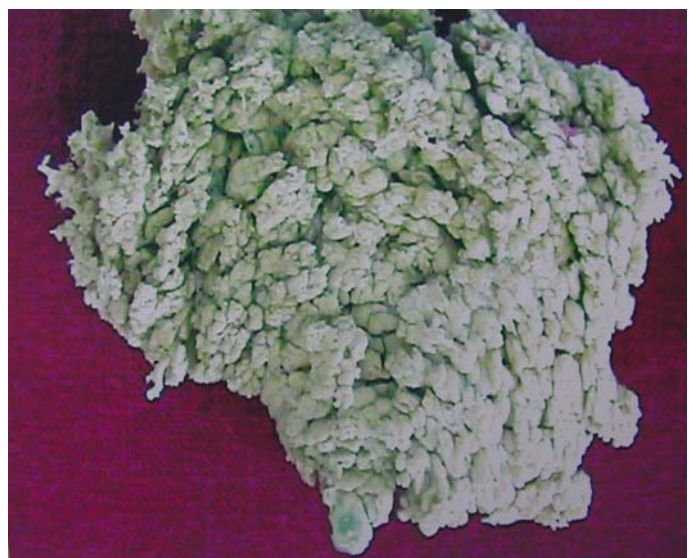
The corrosive preparations were photographed with the use of a digital camera and then computer measured with the use of Lucia version 4.21 programme version.

The volumetric measurement of the gland was done by measuring the volume of water forced out by particular casts of glandular systems.

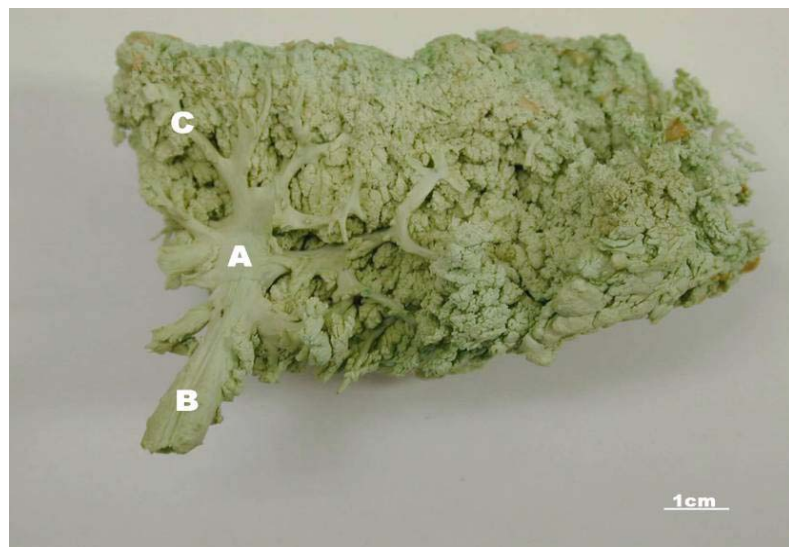
Following pictures show stages of preparing of corrosion models



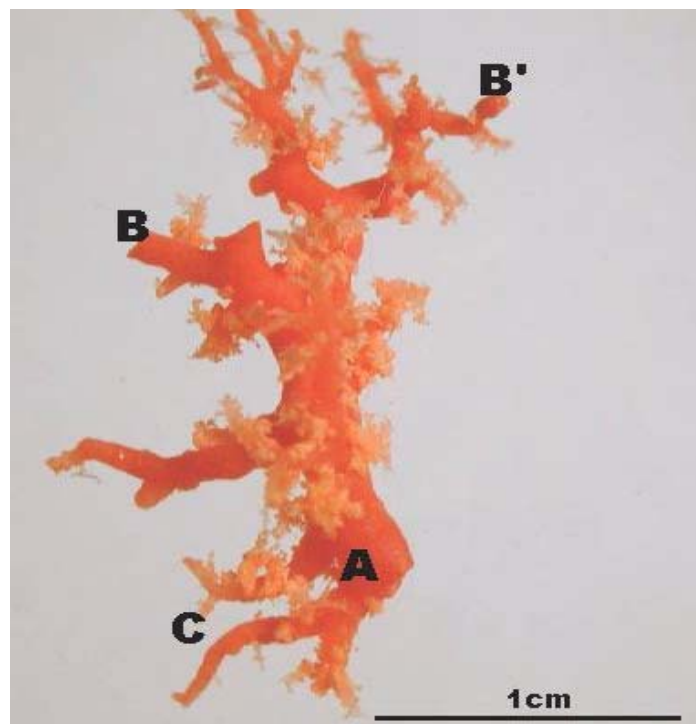
Mammary gland after injection.
A – connective tissue
B,C – gland lobules



The corrosive preparation – lateral side



Medial side of mammary gland.
A – glandular part of milk sinus
B – teat part of milk sinus
C – milk canal



Fragment of milk take out cannals.
A – milk canal
B,B' – smaller milk canals
C – inter lobular canal

Results and discussion

All investigated glands were well developed, apart from property developed teat openings, some teats exhibited additional blind canals. It was observed that the last abdominal and inguinal teats were arranged differently, i.e. perpendicularly to that line. In the studied material majority of glands were 2-canal ones (90,5 %), 3-canal ones were much fewer (only 7,5 %) and 1-canal teats occurred in 1,9 % of cases.

The 2-canal glands were most numerous, the 3-canal ones could be found in all udder areas, i.e. thoracic, abdominal and inguinal ones. On the basis of own observations and contrary to Kudriawcew's (1951) results, the authors of this work are inclined to conclude that milk yield of specific glands is affected primarily by their location on the milk line and not by the number of milk canals. The glands in the thoracic part have a sizeable area for free growth, in the ubdominal part there's less free room and in the inguinum the glands are additionally limited by hind legs (Simons 1996). These facts would explain the changes of gland's shapes depending on its location.

Yet if the glands can have different number of milk canals, the question arises as to its significance. Kudriawcew reported that a decidedly higher number of teats with one milk

canal occurred in primiparous than multiparous sows. Such teats as less milk yielding caused earlier culling of sows due to worse rearing results. According to the same author 3-canal teats are more lactiferous than the 2-canal ones, but occur more rarely. Perhaps it would be worthwhile to conduct selection with a uniform (as far as the number of milk canals is concerned) udder structure in view and secure relatively equal conditions for piglet development.

Udder topography in studied sows

Gland location	Number of glands	Number of unsucked glands	Number of mammary canals		
			one	two	three
thoracic	32	3	-	29	3
abdominal	56	15	1	51	4
inguinal	18	5	1	16	1
total	106	23	2	96	8

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