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DETERMINATION OF BOAR TAINT IN FAT AND MEAT[1]

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Abstract: This study was conducted to determine the presence and intensity of taint in fat and meat of boars depending on the age and live weight of boars, topography of storage of taint in fat and muscles and to present the methods for its determination. It has been established that in 5-month old boars (75-80 kg live weight) taint in fat was low expressed and in meat not expressed. In 7-month old boars (100-105 kg) taint in fat was low to clearly expressed, and in meat not expressed, very low expressed and low expressed. In 3-year old boars (250-300 kg) taint in fat was extremely expressed and in meat very expressed. Our investigations of younger animals showed that taint intensity in fat and skeleton muscles varied. For detection of taint on the slaughter line, sensory method, the use of heated soldering iron is acceptable.

Key words: boar, taint, intensity and method of determination.

Introduction

In pig raising, boars have higher daily gain compared to castrates (*Joseph, 1982; Matenko et al., 1986)*, better feed efficiency (*Costell and Strain, 1985; Matenko et al., 1986*), much higher meat yield in carcasses (*Bokorov et al., 1981; Matenko et al., 1986; Barton-Gade Patricia, 1987; Gruz-Bustillo et al., 1989*) and higher proportion of muscles in ham (*Anastasijević et al., 1981*). Besides, boars, in contrast to castrates, have lower fat proportion in carcasses (*Kunkle, 1966; Wilmowsky et al., 1969)*. However, fattening of boars is not possible because of taint which appears in meat during baking or cooking (*Kunkle, 1966; Patterson, 1466; Wilmowsky et al., 1969)*. For detection of boar taint in meat it is suitable to have a trained sensory commission of assessors (*Joseph, 1978*). Besides this method of detecting taint, subjective taint determination using heated electrical device - soldering iron - is also acceptable (*Theloe et al., 1979)*.

This study was conducted to determine the presence and intensity of taint in fat and skeleton muscles of boars of different age and live weight.

Material and methods

Boar taint in fat and meat (skeleton muscles) were determined in this study.

Presence and intensity of taint in fat and meat were determined in three groups of boars: about 5 months of age (75-80kg live weight), about 7 months of age (100-105 kg), and about 3 years of age (250-300 kg).

Assessment of boar taint intensity at about 7 months of age (100 kg at slaughter) was conducted in fat and meat (skeleton muscles) of different parts of carcasses, topographic position of fat in carcass and type of muscles.

At sensory evaluation of boar taint intensity, modified 1 to 6 points "interval" scale (ISO 4121:198 E, Baltić, 1994) was used. Modification of the "interval" scale was done in part of descriptive assessments, and these are: 1 - not expressed boar taint, 2 - very low expressed, 3 - low expressed, 4 - clearly expressed, 5 - much expressed and 6 - highly expressed boar taint.

Presence and intensity of boar taint, according to the presented modified method were determined after chilling of carcasses for 24 hours. At sensory determination of presence and intensity of boar taint, soldering iron technique has been used. The soldering iron was first heated and than pressed against the samples of fat and meat under examination.

Sensory evaluation was done by three experts.

Results and discussion

According to the results of the investigation, shown in table 1 it may be noticed that the presence and intensity of taint in meat depends on the age of boar. In boars at about 5 months of age (75 to 80 kg live weight) taint in meat was not expressed, and in subcutaneous fat it was low to clearly expresed. In boars at about 3 years of age (250 to 300 kg) taint was much expressed, and in subcutaneous fat highly expressed. According to *Robb et al. (1976)* appearance of taint depends on the breed, type of litter, onset of puberty, number of pigs in the pen during growth, feed and anatomic position of fatty tissue. Complicated nature of

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appearance and intensity of boar taint was indicated by *Wilmowsky et al. (1969).* According to them, boar taint is more intensive at the end of maturity period. It has been noticed that the intensity of taint varies. Some boars do not have meat with typical taint, while in others this taint appears.

Table 1. Determination of boar taint in subcutaneous fat and meat

Live weight of boar at slaughter, kg (age)	Taint (presence and intensity)*
75-80 (about 5 months)	- Neck subcutaneous fat (2) - Back subcutaneous fat (2) - Neck meat (1) - Shoulder meat (1) - Back meat (1) - Ham meat (1)
100-105 (about 7 months)	- Neck subcutaneous fat (3) - Back subcutaneous fat (4) - Neck meat (2) - Shoulder meat (2) - Back meat (3) - Ham meat (1), (2)
250-300 (/about 3 years)	- Neck subcutaneous fat (6) - Back subcutaneous fat (6) - Neck meat (5) - Shoulder meat (5) - Back meat (5) - Ham meat (5)

* Sensory evaluation using soldering iron tehnique
( ) taint intensity evaluation

According to the assessment of boar taint intensity in fat, shown in table 2, it may be noticed that boar taint is equally present in subcutaneous and intermuscular fat. According to the obtained values, intensity of taint is low to clearly expressed and does not depend on the position of fat in carcass. This observation becomes understandable having in mind, according to the reports of *Singh et al. (1988)*, that androstenone, in contrast to skatole and indole, is equally distributed in fat of all regions of pork carcass. Assessment of the taint intensity in skeletal muscles show that taint in some muscles is not expressed whereas in most of muscles it is low to clearly expresed. These results of investigations show that boar taint intensity in meat (muscles), in contrast to fat, is less expressed. This is supported by complicated sensory detection of taint in heated muscles. The reason is, probably, higher water content in it.

*Table 2. Determination of boar taint in subcutaneous fat and meat**

-	Head subcutaneous fat (4)
-	Neck subcutaneous fat (3)
-	Neck intermuscular fat (4)
-	Back subcutaneous fat (4)
-	Loins subcutaneous fat (4)
-	Shoulder subcutaneous fat (3)
-	Ham subcutaneous fat (4)
-	Ham intermuscular fat (4)
-	Breast subcutaneous fat (3)
-	Abdomen subcutaneous fat (3)
-	*M. maseter* (2)
-	*M. splenius cervicis* (2)
-	*M. longissimus thoracis* (3)
-	*M. Longissimus lumborum* (3)
-	*M. triceps brachii* (2)
-	*M. quadriceps femoris* (2)
-	*M. gluteus medius* (1)
-	*M. semimembranosus* (2)
-	*M. pectineus* (2)
-	*M. intercostales* (3)

* Live weight of boar at slaughter about 100 kg (about 7 months of age)
( ) taint intensity evaluation

In our country, Regulations on the quality of slaughtered pigs and categorisation of pork meat (1985) anticipates slaughtering of male non-castrated animals of meat breed up to 6 months of age, of 90 kg live weight, which are for any reason culled from breeding. In the European Union, raising of non-castrated male pigs for meat production is allowed. Live weight of these animals at slaughter must not exceed 80 kg. In Russian Federation, "Slaughter pigs" and "Meat" standards allow slaughter of boars up to 70 kg live weight and 47 kg carcass weight. Meat of these slaughtered pigs is classified as the sixth category *(Kostenko et al., 2004)*. As it can be seen, both our and international regulations allow slaughtering boars. This possibility, at the same time, requires the corresponding assessment of usability of such meat for public consumption and processing. According to *Joseph (1978)*, the selected and trained commission is capable of detecting taint in meat and assessing the usability of meat by sensory evaluation according to point system from 0 (without taint) to 5 (highly expressed taint). Besides, *Theloe et al. (1979)* consider taint detection by means of electrical device very reliable and rapid method compared to cooking method, and they suggest it for a "screening test". Our investigations confirm this opinion. Besides, they suggest that fat, compared to muscles, is more suitable and reliable for detecting presence and intensity of boar taint.

Conclusion

Based on the results of investigations the following conclusions may be drawn:

1. Intensity of boar taint in fat and meat depend on the age of boars and their live weight at slaughter;
2. Use of heated soldering iron is suitable for sensory detection of taint. This method is simple and applicable for determination of boar taint on the slaughter line; and
3. Intensity of taint in fat is higher compared to skeletal muscles, or muscle tissue. For detection of boar taint, it is desirable to use fat, and at the same time skeletal muscles.

ODREĐIVANJE POLNOG MIRISA U MASNOM TKIVU I MESU NERASTA

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Rezime

U ovom radu određivano je prisustvo i vršena ocena intenziteta polnog mirisa u masnom tkivu i mesu nerasta u zavisnosti od starosti i mase nerasta pre klanja, topografije deponovanja polnog mirisa u masnom i mišićnom tkivu, i predstavljena je metoda za njegovo određivanje. Utvrđeno je da je kod nerasta starosti oko 5 meseci (mase pre klanja 75 do 80 kg) polni miris u masnom tkivu vrlo slabo izražen, a da je u mesu nezapažen. Kod nerasta starosti oko 7 meseci (100 do 105 kg), polni miris je u masnom tkivu slabo do jasno izražen, a u mesu nezapažen, vrlo slabo izražen i slabo izražen. Kod nerasta starosti oko 3 godine (250 do 300 kg) utvrđen je u masnom tkivu izuzetno izražen, a u mesu veoma izražen polni miris. Naša ispitivanja mlađih životinja pokazala su da je intenzitet polnog mirisa u masnom tkivu i skeletnoj muskulaturi promenljiv. Pri tome, za otkrivanje polnog mirisa na liniji klanja prihvatljiv je senzorni metod uz primenu zagrejane lemilice.

Ključne reči: nerast, polni miris, intenzitet i način određivanja

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