

INFLUENCE OF SOME ANTISTRESSORS TO TECHNOLOGICAL CHARACTERISTICS OF PORK

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SUMMARY: The aim of this work was to find some antistressors, which are effective in our conditions for improving pork quality. We made experiments with two antistressors: "Suacron" and aminazine.

Pigs were separated into two groups: experimental group (was injected with antistressor) and control group (was not injected). When "Suacron" was tested the experimental group consisted of 40 pigs (21 barrows and 19 sows), control group - of 35 (18 and 17 respectively). Experiments with aminazine were carried out on 26 pigs (12;14). There were also 26 pigs (12) in the control group. Pigs of the experimental group were injected on the farm. They were transported to the slaughter-house. The period from injecting to unbleeding was 4 - 6 hours. The samples were taken 48 hours after slaughtering and cooling.

Protein, water, ash, fat contents, pH, heat loss, water holding capacity and colour were determined in pork. The analysis of results showed that injecting of antistressors did not essentially influence chemical characteristics of pork, but antistressors improved the technological properties of pork. Better results were achieved with "Suacron": heat loss decreased by 2.11 and 0,40 % respectively, water holding capacity increased by 1.96 and 20 %.

INTRODUCTION: The problem of pork quality has recently become very actual in Estonia. Results of our previous experimental work showed that the quality of pork produced in Estonia is very unstable. The amount of PSE-pork (pH < 5.7) was 7.2 - 74.0 % depending on the size of the farm and keeping conditions (REI et al 1991). One of the main factors that cause PSE-complex in pork is the stress of pigs. Stress-sensitiveness causes many technological problems and reduces economical indexes of meat product manufacture. The slaughter weight of pigs transported in stress condition may be to 4 % less than of pigs without stress. Experiments carried out with pigs in Estonia showed that transport-stress decreased slaughter weight by 2,5 % when pigs were transported for 65-70 km. Bacon-weights were more stress-sensitive (EILART, 1988). The decreased water-holding capacity of PSE-pork resulted in lowered technological yield of the manufacture of cooked cured ham and increased the amount of meat in the formula of cooked sausage when compared to those of normal pork. This decrease in technological yield corresponded to a loss of 2.0 and 5.0 FMK/kg for the cooked ham made of PSE-meat from non-stressed and halotan positive pigs, respectively. In addition the increased amount of PSE-pork decreased the price of sausage by 0.13 FMK/kg (HONKAVAARA, 1989). PSE-pork can be used to a limited extent for dry sausage, raw ham and sometimes for frankfurter type sausage. PSE-pork is unsuitable for cooked ham and other cooked cured products (WIRTH, 1986).

Many tranquilizers were tried out: fenazepam (OPPOBA, 1985), preparation UCC-112 (CEP-112, 1987), etc. to reduce stress-sensitiveness which causes reduction of pork quality and quantity. Therefore the problem of the use of antistressors for improving pork quality and quantity is actual nowadays in many countries and in Estonia as well.

MATERIAL AND METHODS: Two antistressors were tested: "Suacron" (firm "Premix" Wirkstaff AG, Germany) and aminazine. Pigs were bred in Experimental Pigs Farm in Viljandi district. When pigs were slaughtered one pig pen was chosen, half of the pigs (12-13) were separated and 5 ml of Suacron-aminazine-solution was injected, pigs were marked. The control-pigs (without injecting) were marked also. After that pigs were transported to the slaughter-house and chilling to Vohma Meat Factory (ca 50 km). The period from injecting to unbleeding was 4-6 hours.

When "Suacron" was tested the experimental group consisted of 40 pigs (21 barrows and 19 sows), control group - 35 (18-17). The experiments with aminazine were carried out on 26 pigs (12;14) and in the control group there were 26 pigs (14;12). The slaughter weight of pigs was 55,3-102,5 kg (arithmetical mean- 73,7 kg), they belonged mainly to the I and II category (table 1).

Meat carcasses were chilled to 4 °C inside the muscles during 48 hours. The probes for analysis were taken from the chine between 6-11 ribs. We determined in pork protein, water, ash and fat contents, pH, heat loss, water holding capacity and colour. Chemical characteristics were measured accordingly to generally used methods.

RESULTS AND DISCUSSION: The results of experiments (table 2) showed that injecting of antistressors did not evoke significant differences in water, ash, fat and protein content which is quite normal as the period of influencing antistressors to pigs was short (4-6 hours). More significant from technological point of view are water holding capacity, heat loss and pH-value. Data in table 3 show, that although average means do not have great differences (experiments with "Suacron": experimental group 5.88, control group 5.82; aminazine 5.70 and 5.70 accordingly). Wavering between different experimental groups was significant: minimal (pH 5.3) in experiments with aminazine and maximum (6.7) in experiments with "Suacron". Unstable pH-values in pork were probably called forth by individual properties of pigs but not by injecting of antistressors.

CONCLUSION: Injecting of antistressors did not essentially influence chemical characteristics, but it improved the technological properties of pork. The results with "Suacron" were better than with aminazine: heat loss decreased by 2.11 and 0.40 %; water holding capacity increased by 1.96 and 1.20 %. But since the farmers are not paid for meat quality, they are not interested in using antistressors or other methods for lowering stress in pigs.

Table 1

Distribution of pigs by categories

Experimental group				Control group			
Category	Number of pigs (gender)	Slaughter weight, kg		Category	Number of pigs (gender)	Slaughter weight, kg	
		Mean	Fluctuation			Mean	Fluctuation
<u>Experiments with "Suacron"</u>							
I	7(5S*,2B**)	66.3	62.5 - 71.6	I	14(3S,11B)	63.6	55.3 - 70.0
II	27(13S,14B)	80.3	72.2 - 88.7	II	20(14S,6B)	75.7	65.0 - 92.7
III	6(1S, 5B)	90.2	77.6 - 102.5	III	1 (1 B)	97.0	97.0
Sum or mean	40(19S,21B)	79.4	62.5 - 102.5		35(17S,18B)	71.0	55.3 - 97.0
<u>Experiments with aminazine</u>							
I	11(4S,7B)	68.5	57.7 - 72.5	I	14(9S,5B)	63.6	56.5 - 70.6
II	12(7S,5B)	76.8	64.7 - 83.6	II	12(3S,9B)	76.2	59.5 - 84.0
III	3(2S,1B)	87.8	82.4 - 92.8	-	-	-	-
Sum or mean	26(13S,13B)	74.5	57.5 - 92.8		26(12S,14B)	69.4	56.5 - 84.0

Note: * - S - sow
 ** - B - barrow

Table 2

Concise data about pork characteristics

Characteristics	Experiments with "Suacron"		Experiments with aminazine	
	Experimental pigs	Control pigs	Experimental pigs	Control pigs
Number of investigated carcasses	40	35	26	26
Water content, %	74.24	73.80	74.23	74.16
Ash content, %	1.25	1.20	1.20	1.26
Fat content, %	1.88	2.40	1.97	2.39
Protein content, %	22.63	22.60	22.58	22.16
Protein content, % from dry material	87.85	86.26	87.62	85.76
pH	5.88	5.82	5.70	5.70
Water holding capacity, %	67.42	65.46	68.55	67.35
Heat loss, %	41.87	43.98	35.80	36.20
Colour of meat (max 9 points)	6.0	5.9	6.5	6.5

Table 3

Average means and fluctuation of some pork characteristics

Group of pigs	pH		Water holding capacity, %		Heat loss, %	
	Mean	Fluctuation	Mean	Fluctuation	Mean	Fluctuation
<u>Experiments with "Suacron"</u>						
Experimental group	5.88	5.6 - 6.7	67.42	55.05 - 73.99	41.87	36.11 - 46.51
Incl. I cat.	5.90	5.7 - 6.1	68.86	64.47 - 73.37	41.24	36.11 - 46.51
II cat.	5.80	5.5 - 6.3	67.19	58.39 - 73.25	42.27	38.61 - 45.83
III cat.	6.00	5.7 - 6.7	66.97	60.89 - 73.08	40.79	36.67 - 44.83
Control group	5.82	5.4 - 6.5	65.46	55.28 - 74.60	43.98	36.37 - 58.69
Incl. I cat.	5.81	5.7 - 6.1	65.69	53.62 - 72.41	44.54	40.97 - 47.83
II cat.	5.84	5.4 - 6.5	65.52	55.28 - 74.60	43.54	36.37 - 58.69
III cat.	5.70	5.7	61.09	61.09	44.68	44.68
<u>Experiments with aminazine</u>						
Experimental group	5.70	5.3 - 6.2	68.55	59.33 - 74.62	35.8	20.0 - 44.7
Incl. I cat.	5.65	5.3 - 6.1	69.27	59.33 - 74.62	36.5	20.0 - 43.2
II cat.	5.73	5.5 - 6.2	67.48	62.30 - 72.95	34.9	20.7 - 44.7
III cat.	5.47	5.4 - 5.6	70.10	68.24 - 71.96	42.8	36.2 - 37.9
Control group	5.70	5.3 - 6.4	67.35	56.85 - 75.69	36.2	22.6 - 42.1
Incl. I cat.	5.68	5.3 - 6.0	66.96	56.85 - 73.75	35.1	22.6 - 41.1
II cat.	5.83	5.4 - 6.4	67.82	56.95 - 75.69	39.0	28.9 - 42.1

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