1.3 Influence of halothane positive pigs on technological yield of cooked ham

MARKKU HONKAVAARA

Finnish Meat Research Centre, Hämeenlinna, Finland

Introduction

In Finland the economic significance of meat quality has been taken into account in the pig breeding index since 1982. In calculations the decline in the value of the PSE carcass has been used. Thus the reduced water binding capacity of the PSE meat in sausage processing and the lower than normal technological yield in the processing of cooked ham (2) are taken into account. The cooked ham test provides a rather reliable explanation of the variation in meat quality, for example the practical significance of the PSE cases (1).

The study sought to explain the difference in quality between halothane positive and halothane negative pork.

Material and methods

Meat quality was determined with the following methods: the pH_1 value of the carcass (Knick 651 and Ingold 406-M4-electrode), the water binding capacity (3) and the chemical composition of the meat, the technological yield and chemical composition of the cooked ham and also the organoleptic quality.

The test material consisted of six halothane positive and halothane negative pigs and six untested control pigs. Forty-five minutes after stunning the pH value of the carcasses was measured in the middle of m. longissimus dorsi, the next day the hams from the carcasses were deboned and samples were taken, following which the hams were salted (in brine, 1.9% phosphate and 13% salt), kept overnight, tumbled (14 h), strung in a net, smoked (1 h) and cooked (14 h, 50-75°C). Samples were taken from the completed product, and the number of kilograms of cooked ham that could be made from each batch of cut ham was calculated.

Results and discussion

Of the halothane positive pigs 67% (4/6) were PSE cases ($pH_1 \leq 5.8$), and 17% (1/6) of the halothane negative.

The results on water binding capacity of the ham (inside round) correspond to previous results. Thus normal meat was compared with a severe PSE case (2). The water binding capacity of ham was 33.8% lower for a halothane positive pig than for a halothane negative pig, and 63.3% lower than that of the untested control pigs (pH_1 6.3). The water binding results are in table 1.

Table 1. The water binding capacity of the halothane tested pigs. Hal- did not react to halothane, hal + reacted to halothane, and control pig (pH_1 6.3).

Pig type	Number of samples	Water binding capacity, %
hal-	3	42.3
hal+	4	28.0
control	3	76.3

The chemical composition of the test pigs is presented in table 2. There was no significant difference between the halothane positive, halothane negative and control pigs.

Table 2. The chemical composition of the meat of the halothane tested pigs. Six halothane positive hal+ and six halothane negative pigs hal- and three untested control pigs.

Pig type	Cut of meat	Water, %	Protein, %	Fat, %
hal+	spare rib	70	19	11
hal-	"	69	18	13
control	"	66	17	18
hal+	loin	70	20	10
hal-	"	71	21	8
control	"	67	19	15
hal+	outside round	75	21	5
hal-	"	74	21	6
control	"	73	20	7
hal+	inside round	76	22	3
hal-	"	77	21	3
control	"	76	22	3

The technological yields of cooked ham made from the test pigs are presented in table 3. The technological yield of cooked ham made from the ham of a halothane positive pig was 11.9% points lower than the technological yield of cooked ham from a halothane negative pig and 13.8% points less than the technological yield of cooked ham from a control pig (pH_1 6.3). It was established in previous studies that the technological yield of cooked ham from a severe PSE pig ($pH_1 \leq 5.4$) was 4.7% points less than normal (2).

Table 3. Technological yield of cooked ham. Pig types in table 1.

Pig type	Technological yield
hal-	105.9
hal+	94.0
control	107.8

The chemical composition and organoleptic quality of the cooked hams is presented in table 4. There was no difference in the chemical composition of cooked hams made from the control and halothane negative pigs. Compared with these there was less water (3.1% points) and fat (1.0% points), but more protein (3.7% points) in the cooked hams made from halothane positive pigs.

Table 4. The chemical composition and organoleptic quality of cooked hams. Outward appearance 0-3, structure 0-5 and taste 0-7 points. Total points 12-15 for good and 9-11.5 for satisfactory.

Pig type	Water %	Protein %	Fat %	Salt %	Comp. P_2O_5	Organoleptic quality points	remarks
hal-	75.7	18.6	3.2	2.9	0.59	11.5	best structure
hal+	72.4	22.2	2.5	3.2	0.59	9.0	crumbly, dry, worst structure
control	75.2	18.5	3.8	2.9	0.57	10.0	crumbly, watery

References

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