Influence of crossbreeding and seasoning period on some characteristics of salami of Cinta Senese

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ABSTRACT: The aim of the present work was to study the effect of genetic type and seasoning period on chemical and fatty acids composition of salami of Cinta Senese. Salami belonging to three genotypes (Cinta Senese (CS), Duroc (D) x Cinta Senese and Large White (LW) x Cinta Senese) were used. Analysis were performed on fresh mixture (0 day) and on cured product at three seasoning times (6, 30 and 120 days).

Salami from CS and DxCS pigs showed a higher total lipid content in comparison with those from LWxCS pigs (41.90, 39.51 vs. 32.76% respectively).

Moreover salami of CS showed higher percentage of MUFA (50.63 vs. 49.49 and 49.51%) and lower percentage of PUFA n-6 (8.79 vs. 9.64 and 10.28%) and total PUFA than DxCS and LWxCS, respectively. As regard seasoning period, a significant effect was found on MUFA content that increased during the seasoning. Moreover PUFA n-3 and n-6 decreased in the first three seasoning times (0, 6, 30 days) whereas at the end of curing (120 days) showed a significant increase (PUFA n-3: 0.47 vs. 0.34 vs. 0.27 vs. 0.35 %; PUFA n-6: 10.78 vs. 9.30 vs. 8.54 vs. 9.66 %; at 0, 6, 30 and 120 days, respectively).

Key words: Cinta Senese, Fatty acids, Pig breed, Salami.

INTRODUCTION- Dry cured products are very important in Cinta Senese breed because of their typical organoleptic characteristics and the high added value. Beside dry cured ham that is the product with the higher commercial value also fermented sausage has a wide position in the market.

Nowadays the demand of salami of Cinta Senese is growing because of its high quality and its smaller price respect to/in comparison with dry cured ham. For that reason it could be taken into account the opportunity to supply products from Cinta Senese crossed with other breeds. In the present work chemical characteristics and fatty acids composition of fermented sausages of Cinta Senese as affected by genetic type and seasoning time have been taken into account.

MATERIAL AND METHODS - Fifty-one pigs were used: 17 pure Cinta Senese (CS), 18 Large-White x Cinta Senese (LWxCS) and 16 Duroc x Cinta Senese (DxCS). Animals of each genetic type were distributed in two groups according to rearing system: outdoors (25 pigs) and indoors (26 pigs). The six groups were fed the same commercial diet (wheat bran, barley, corn and soy-bean-meal).

Pigs were slaughtered at 153 kg (± 14.04 kg) of live weight on average. Fermented sausages were made the day after slaughtering with Longissimus dorsi and backfat in the ratio of 3:1. Mixtures were obtained using the meat of several (two - four) animals of each breed x rearing system combination. From each mixtures four salami were obtained that were sampled at 0 (immediately after mixing), 6, 30, 120 days of seasoning and samples were stored at -80°C until analysis.

The following analysis were carried out: moisture, protein and ash content (A.O.A.C., 1990), total lipids (Folch et al., 1957), fatty acid composition (Morrison and Smith, 1964) and malonaldehyde content (MDA) (Pikul et al., 1983). Data were analysed by GLM procedure (SAS, 2003) following the model: Yijklm =µ + R_i+S_j+(RS)_{ij}+P_{ijk}+T_l+E_{ijklm} where: µ=mean; R=breed; S=rearing system; T=seasoning period; P=lot of product (mixture) used as error term for contrast among breeds and between rearing systems; E=residual.
RESULTS AND CONCLUSIONS - As concern rearing system (data not tabulated) no effect was recorded on chemical traits and fatty acid composition. The genetic type significantly affected chemical and fatty acid composition of salami (Table 1).

Total lipid percentage was greater in CS and DxCS than in LWxCS, though the mixture had the same proportion of lean and fat. LWxCS had the highest protein and ash content and moisture.

For fatty acids composition, C14:0 content was higher in CS and DxCS pigs than in LWxCS even if no effect of genetic type was found on SFA level. CS pigs showed lower values of linoleic acid and PUFA n-6 percentage than DxCS and LWxCS.

As regard oxidation products, DxCS salami showed higher MDA content than CS because of their higher content in PUFA which is the main substratum of oxidative phenomena (Gandemer, 2002).

The effect of seasoning period on chemical and fatty acids composition is reported in table 2. During the seasoning the water content decreased whereas protein, lipid and ash percentage increased, on overall. Obviously, the highest absolute variations occurred during the longest interval (30-120 days). As concern fatty acids composition, variation seemed minimal and often without a definite trend.

However it is noticeable that PUFA content decreased during the first 30 days and then increased at the end of curing whereas MDA content showed opposite results: an increasing at the beginning and a decreasing at the end of seasoning.

Cava et al. (1999) showed the same result on Iberian ham. It seems that PUFA content increases the susceptibility to oxidative phenomena.

The results obtained in the present work led to postulate some considerations mainly on the effect of genetic type, so Duroc breed seems more similar to Cinta Senese in total lipid content but closer to Large White in acidic composition.

Table 1. Effect of genetic type on chemical and fatty acid composition of salami.

| Genetic type | CS   | DxCS  | LWxCS   | DSR |
|--------------|------|-------|---------|-----|
| Moisture %   | 34.15A| 34.89A| 40.38B  | 4.58|
| Protein %    | 15.18A| 16.40A| 18.15B  | 1.68|
| Total lipids %| 41.90A| 39.51A| 32.76B  | 4.69|
| Ash %        | 4.71A | 4.90AB| 5.44B   | 0.47|
| C14:0 %      | 1.43A | 1.47A | 1.29B   | 0.05|
| C16:0 %      | 25.02 | 25.01 | 24.41   | 0.38|
| C16:1 %      | 2.55  | 2.42  | 2.34    | 0.09|
| C18:0 %      | 13.31 | 13.32 | 13.64   | 0.37|
| C18:1 %      | 46.97 | 46.24 | 46.08   | 0.86|
| C18:2 %      | 8.29A | 9.11B | 9.69B   | 0.63|
| C18:3 %      | 0.34  | 0.38  | 0.35    | 0.06|
| SFA %        | 40.23 | 40.28 | 39.83   | 0.69|
| MUFA %       | 50.63A| 49.49B| 49.51B  | 1.04|
| PUFA n-6 %   | 8.79A | 9.64B | 10.28B  | 0.68|
| PUFA n-3 %   | 0.34  | 0.38  | 0.35    | 0.06|
| PUFA tot %   | 9.12A | 10.02B| 10.63B  | 0.74|
| MDA mg/Kg    | 1.79A | 2.12B | 2.05AB  | 0.42|

*Other fatty acids detected but not reported, below the threshold of 0.25%: C12:0; C17:0; C17:1; C20:0; C20:1; C20:2; C20:4; C20:3.
A, B, C means different (P<0.05).
Table 2. Effect of seasoning period on chemical and fatty acid composition (%) of salami.

| Seasoning period (days) | Moisture | Protein | Total lipids | Ash | Fatty acid* |
|------------------------|----------|---------|--------------|-----|------------|
|                        | %        | %       | %            | %   | %          |
| 0                      | 40.60A   | 15.36AB | 36.89A       | 3.61A | C14:0 1.38A |
| 6                      | 39.53A   | 14.81A  | 37.55A       | 4.66B | C16:0 24.36A |
| 30                     | 37.80A   | 16.58B  | 36.51A       | 5.10C | C16:1 2.41 |
| 120                    | 27.98B   | 19.5C   | 41.25B       | 6.70D | C18:0 13.15A |
| DSR                    | 4.58     | 1.68    | 4.69         | 0.47  | 0.05       |

*Other fatty acids detected but not reported, below the threshold of 0.25%: C12:0; C17:0; C17:1; C20:0; C20:1; C20:2; C20:4; C20:3.

A, B, C, D means different (P<0.05).

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Research supported by COFIN-MIUR Anno 2003 - prot. 2003074491_001, prof. Gustavo Campodoni.

The authors thank the managerial and technical staff of the ex ASFD.