

APPLICATION OF SCALDED SWINE RIND PREPARATION IN THE PRODUCTION OF COOKED SAUSAGES. I. INFLUENCE OF THE SCALDED SWINE RIND PREPARATION UPON THE PROXIMATE COMPOSITION AND PROTEIN QUALITY OF THE COOKED SAUSAGES

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SUMMARY

The aim of the present work was to study the influence of inclusion of swine rind preparation to a level of max 10 % of the filling mass upon the proximate composition as well as the ratio of the total protein so connective tissue protein of cooked sausages has been investigated.

Three different kinds of typical Bulgarian cooked sausages, namely - "Kamchia", "Vial" and "Srednogorska" prepared with different recipes and structures and diameter were used in this study.

Sausages were prepared with the inclusion of 2, 6 and 10 % swine rind preparations. The swine rind preparations were prepared with the addition of 0.5 % sodium-3-polyphosphate. Control samples were prepared in the normal traditional way without swine rind preparation.

The proximate composition viz., total protein, connective tissue protein, fat, moisture content, salt and ash of the finished products were analysed as per standard procedures.

No significant differences ($p > 0.05$) in the proximate compositions were observed in all the samples. Therefore, it is concluded that the inclusion of scalded swine rind preparation to a level of 2 - 10 % to the filling mass of sausages of the types "Kamchia", "Vial" and "Srednogorska" may be included without affecting the quality of the product.

INTRODUCTION

Rinds of scalded pork are collagen containing raw materials. During high temperature processing the collagen of the rinds get converted into gelatin which plays an important role in the physiology of human nutrition (Flores and Barmel, 1988). Hence, swine rinds have wide application in the meat industry.

Available literatures indicate successful application of high percentages of collagen (Comer, 1979), wherein the collagen containing raw materials are added in the form of pretreated emulsions (Jones et al., 1978a, 1978b; Sadowski et al., 1980; Gillet, 1987).

Application of scalded swine rind homogenate with ice has been reported by Bader (1988). The author used 2, 6 and 10 % homogenate of swine rinds with ice in the filling mass of cooked sausage and reported that the overall proximate composition of the treated samples did not differ from the control samples. However, reported an increase in the total fat with the increase in the amount of added swine rinds and decrease in the ratio of total protein: connective tissue protein in the tested samples (6.3) as compared to the control samples (8.1) when 10 % swine rind homogenate was used.

The studies in the East Germany on 25 different assessments of cooked sausages, raw-dried sausages and poultry sausages also indicate that inclusion of swine rind preparation did not cause much alteration in the ratio of connective tissue protein to total protein and in majority of the products the ratio was in before 5 to 8 (Rommingen and Randriananja, 1989).

The aim of the present study was to determine of changes in the general proximate composition and quality of the protein (ratio between total protein: connective tissue protein) of the cooked sausages prepared with the inclusion of different levels of scalded swine rind preparation.

MATERIALS AND METHODS

Three different kinds of cooked sausages ("Kamchia", "Vial" and "Srednogorska") different recipes, structures and diameters were used in this study. The salted swine rinds homogenized with the addition of ice (1:1) and

0.5 % tripolyphosphate and the homogenate was added to the filling mass of the sausage at the rate of 2, 6 and 10 %. The type and the ratio of the raw materials to the spices of the individual assessment of the sausages are presented in table 1. The following parameters were analysed for determining the general proximate composition of the samples: total protein, according to the method of Kjeldahl (1883) to Kielteck auto 1030 (Tecator); dry matter, by drying the sample at 105 °C till constant weight (Pojarskaia et al., 1964); total fat, extraction by diethyl ether according to Soxhlet (Pojarskaia et al., 1964); total ash, by mineralisation of the sample in the muffle furnace at 600 - 800 °C; content of salt, according to method of Auel (Pojarskaia et al., 1964); protein content in the connective tissue, by quantitative determination of oxyproline (BSS, 1979). The results obtained from 9 different studies were analysed statistically and per standard method (Gueorguieva et al., 1987).

RESULTS AND DISCUSSION

The general proximate compositions of the treated sausages are presented in the following table: table 2 ("Srednogorska"), table 3 ("Kamchia") and table 4 ("Vial"). From the results it is seen that with the increase the levels of the added swine rind preparations there was a non-significant increase of the moisture content, total protein, connective tissue protein, salt and total ash, whereas, the quantity of the total fat and dry matter decreased slightly. Multiple regression analysis of the result according to the method of Neuman and Keuls (Gueorguieva et al., 1987) with the deviation of 0.05 showed that the results of the each of the two closer samples as well as each of the two distant samples (control sample and sample with 10 % swine rind preparation) were statistically non-significant. This showed that inclusion of the swine rind preparation to a level of 2 to 10 % of the sausage mix did not cause any change in the general proximate composition of the treated sausages. From the view point of the addition of these proteins in the sausage it was of interest to investigate the changes in the ratio of the total protein to the connective tissue protein in the samples containing different quantities of the swine rind preparations (Fig. 1) With the increase in the quantity of the preparation in the filling mass the ratio between total protein and connective tissue protein showed a tendency to narrow down, with the exception in the samples with 2 % preparation in the sausage "Kamchia" and "Vial". Nadenitsa "Srednogorska" normally contains certain amount of meat with high content of beef connective tissues and as such any increase in the amount of added swine rind preparation caused a reduction in total protein and connective tissue protein (upto 10 % of the filling mass), but the difference between the control samples and treated samples with 10 % swine rind preparation was within the limit of 0.5. From the changes in the ratio between total protein and connective tissue protein of the different sausages studied (Fig. 1) it may be concluded that the addition of the scalded swine rind preparation to a level of 2 - 10 % of the filling mass did not affect the quality of protein in some of the cooked sausages ("Kamchia", "Vial" and "Srednogorska"). These results are in accordance with the findings of other researches (Boger, 1988; Romminger and Randrianaja, 1989).

CONCLUSIONS

The analysis of the results obtained from the investigation lead us to make the following conclusions:
The inclusion of scalded swine rind preparations to a level of 2 - 10 % of the filling mass did not cause any statistically significant change in the proximate composition of the cooked sausages.
Quality of the protein expressed as the ratio between the total protein and connective tissue protein was not affected by the addition of 2 - 10 % of the swine rind preparations.

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