

AN ATTEMPT TO UTILIZE BEEF GULLET MEAT TISSUE IN TECHNOLOGICAL PROCESSING

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SUMMARY

The objective of the studies was the possibility of 15% and 25% processed beef substitution for beef gullet in fine comminuted sausage processing.

The production of sausages was based on typical, industrial technology for fine comminuted sausages. The product processed with 15% and 25% of beef gullet was characterized by significantly lower production yield i.e. 1.9% and 4.1% less than control the product /without gullet/, respectively. In addition to that, the beef gullet meat tissue reduces water holding capacity and texture of the sausages. The colour of the studied product was lighter and less stable as comparison to the control product. As a result of organoleptic evaluation no statistical differences were found between the products processed with 15% of the gullet and beef only. It is suggested that beef gullet meat tissue could be used for tenderization or precooking in fine comminuted sausage manufacturing as a substitute for beef processed meat. The substitution for gullet should not exceed 15%.

INTRODUCTION

The low value raw materials like beef gullet meat tissue should be used in meat processing more often than present. Earlier works were focused on the basic characteristic of the beef gullet meat tissue /GORSKA et al, 1988/, functional properties of its proteins and on evaluation of the collagen thermostability /GORSKA et al, 1985, 1986/. It was found that protein content of beef gullet was close to the protein content of processed beef. Beef gullet meat tissue is characterized by adequate exogenic amino acid balance and is a rich source of mineral components /GORSKA et al, 1988/.

The purpose of our studies was the assessment of potential use of the beef gullet meat tissue as a substitute for processed beef in the production of fine comminuted /emulsified/ sausages.

MATERIAL and METHODS

Fine comminuted sausages were produced replacing processed beef with 15% /variant B/ or 25% /variant C/ by beef gullet.

The resulted sausages were assessed determining: protein content, fat-free dry matter, fat content /BUDSŁAWSKI and DRABENT, 1972/, water holding capacity /SZMANKO, 1986/, production yield and physical parameters colour - dominant wavelength λ_d , colorimetric purity /pe/ and luminance /Y/. Colour stability was determined after continuous illumination with white fluorescent light with on intensity of 250 lx for 3, 6 and 12 hours /TYSZKIEWICZ, 1969/. Consistence was measured with LP penetrometer equipped with 2 mm in diameter plunger.

Sensory evaluation of the finished product was based on 5 point scale /BARYŁKO-PIKIELNA, 1975/. The data obtained in the study were analysed statistically, using programme - "STATGRAPHICS 2.1" and IBM computer.

RESULTS

The use of the beef gullet meat tissue affected the chemical composition of the finished products /Tab.1/. Sausages manufactured with 15% and/or 25% addition of experimental material were characterized by 0.3% and 0.9% lower protein content respectively due to lower total protein content in beef gullet in comparison to processed beef.

The use of the beef gullet in sausage manufacturing has not changed the determined amount of fat-free dry matter content in the finished product, while there was observed a significant difference between fat content in sausages processed with 25% substitution of processed beef by beef gullet and a control sample.

The greatest addition of beef gullet /25%/ reduced the production yield of sausages due to most probably lower water holding capacity of beef gullet /Tab.1/. It can be suggested that low WHC worsened the gelling properties of the beef gullet /GORSKA et al., 1988/. Modification of beef gullet thermal treatment resulted in improved gelling properties of the raw material in mind /GORSKA et al, 1986/.

The texture of the B and C variants of sausages was less firm than the texture of the control product probably due to reduced binding capacity of sausage batter /SIKORSKI,1988/.

Sausage processed with beef gullet were characterized by lower values of the physical colour parameters L^* , a^* , b^* , Y . It was observed that the addition of beef gullet meat tissue decreased red colour contribution and increased yellow colour contribution which caused worsening in colour impression of the products.

The most dynamic changes in colour stability observed were during first 3 hours of the illumination of the sausages samples. Generally, during storage the lightening of the sausage colour was observed.

The addition, of the beef gullet decreased the organoleptic quality of the finished products. Control sausages were judged 4,0 points for overall impression, while sausages of variants B and C only 3,8 and 3,3 points respectively. Especially sausage of the variant C was characterized by low juiciness and less acceptable of as well worse consistence and colour. Graininess and free water content of the sausage C was noticed by sensory panel members.

CONCLUSIONS

1. It is possible to use beef gullet meat tissue as a substitute for processed beef, but the addition should not exceed 15%.
2. Thermal treatment and comminution of beef gullet give possibility for a wide utilization of beef gullet in processed meat manufacturing.

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Tab.1. Chemical and technological characteristics of sausages /n = 12/.

Parameters		Total protein /%/	Water /%/	Fat-free dry matter /%/	Fat /%/	WHC /%/	Consistence /mm/	Yield /%/
Variants of sausages	A	\bar{x}	11,6	60,6	12,4	26,5	58,5	14,6
		s	1,1	3,1	0,9	2,2	5,6	0,9
	B	\bar{x}	11,3	66,1	12,7	25,9	52,7	15,7
		s	0,8	3,6	0,9	2,5	6,7	0,9
	C	\bar{x}	10,7	62,8	12,2	24,5	50,0	17,6
		s	0,7	2,3	1,1	1,1	6,1	0,8

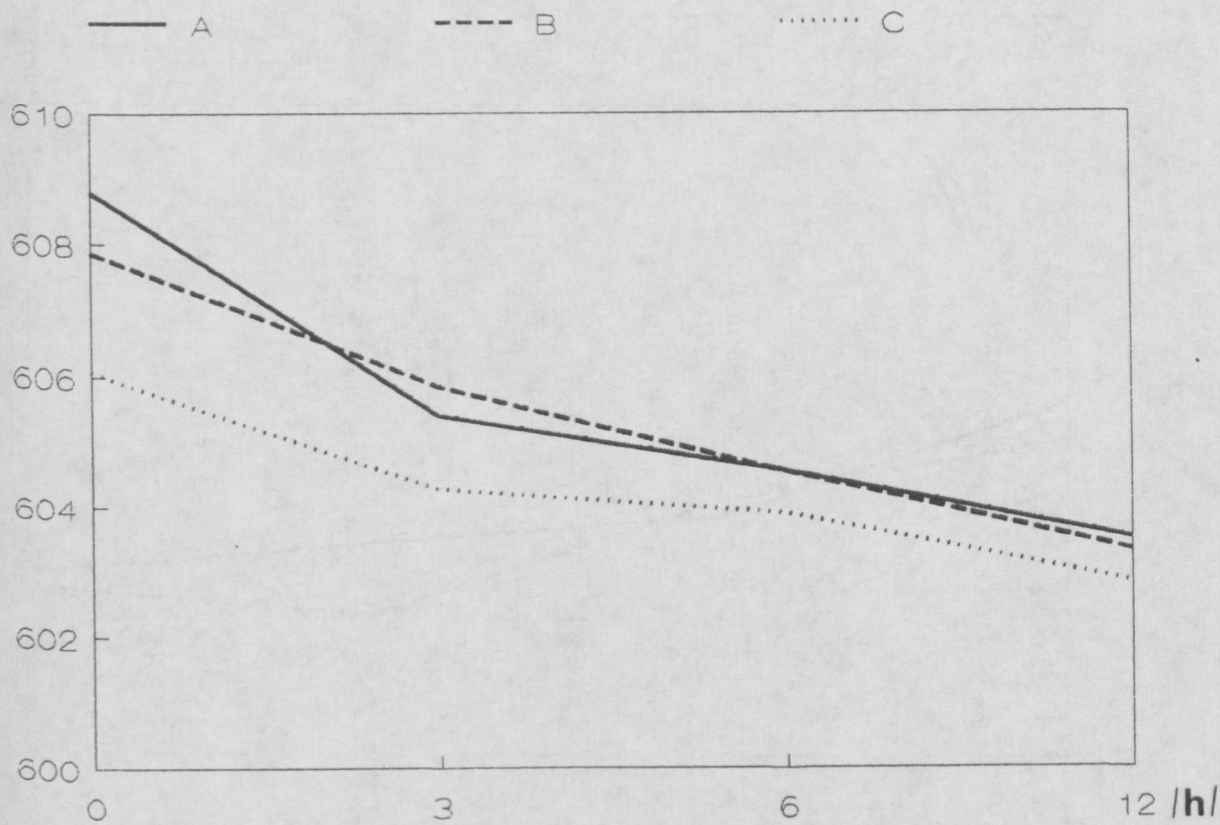


Fig.1. COLOUR STABILITY OF THE SAUSAGES λd . $n = 12$

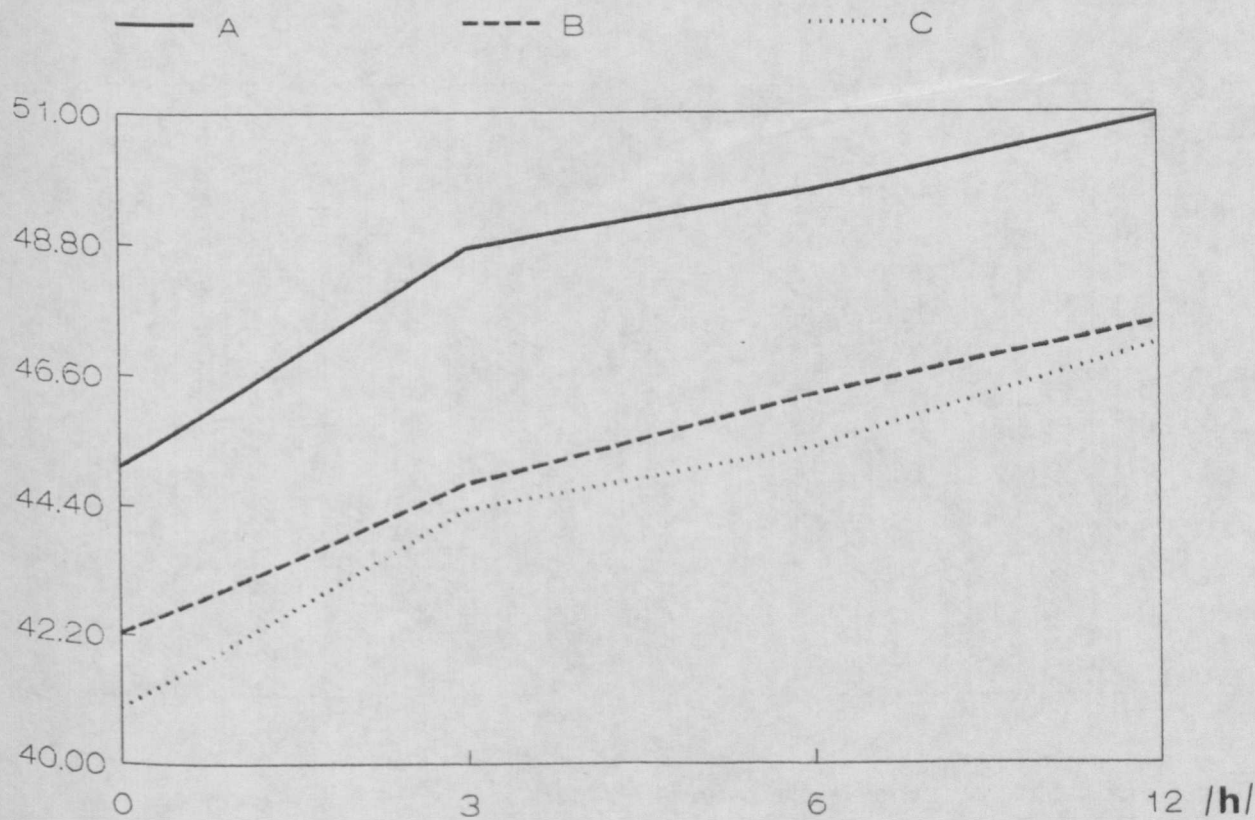


Fig.2. COLOUR STABILITY OF THE SAUSAGES Y . $n = 12$

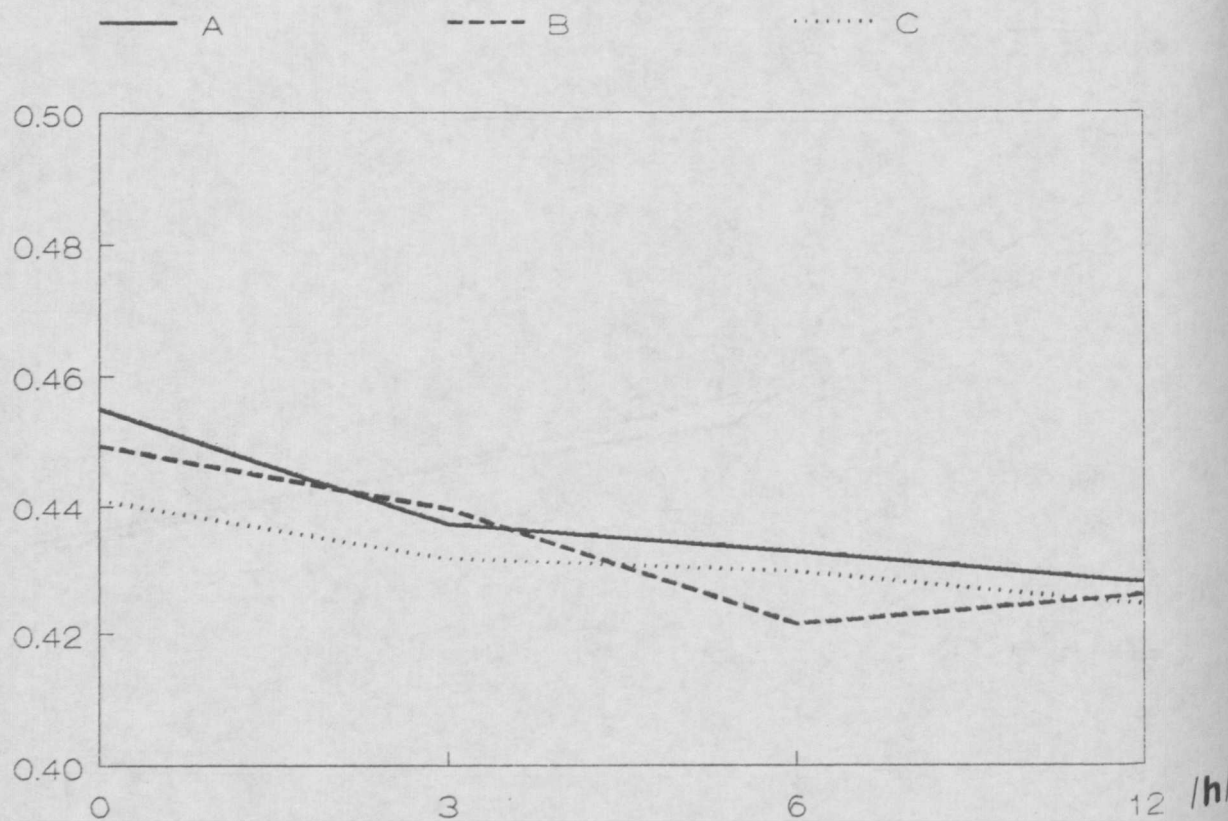


Fig.3. COLOUR STABILITY OF THE SAUSAGES /pe/. /n = 12/

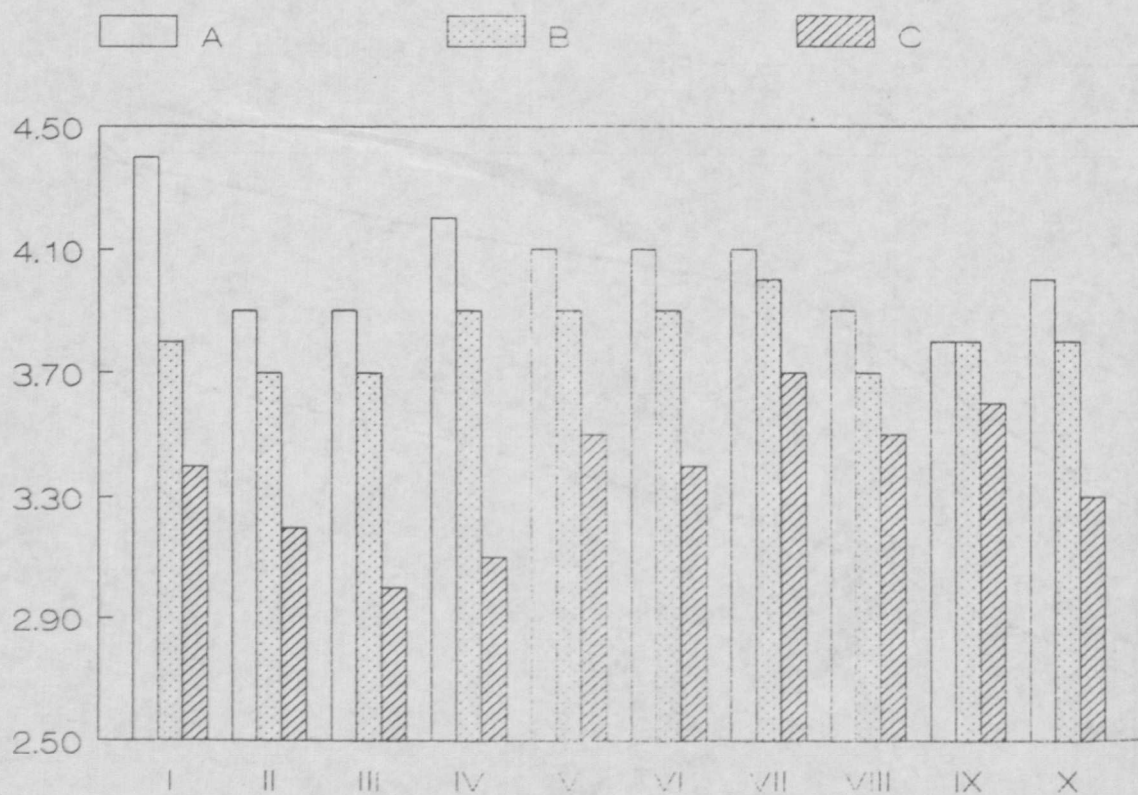


Fig.4. ORGANOLEPTIC EVALUATION OF THE SAUSAGES /n = 12/

I - PRODUCT OVERALL ASSESSMENT
II - COLOUR INTENSITY
III - COLOUR DESIRABILITY

IV - CONSISTENCE
V - FLAVOUR INTENSITY
VI - FLAVOUR DESIRABILITY

VII - JUICINESS
VIII - ODOUR INTENSITY
IX - ODOUR DESIRABILITY
X - OVERALL ORGANOLEPTIC EVALUATION