6 - 23 UTILIZATION OF A FAT: RIND : BROTH EMULSION IN BRÜHWURST TYPF SAUSAGES

Ramón Santos
Eloina Cuello
Regla López

Food Industry Research Institute, Hab., Cuba

Introduction

"Brühwurst"- type sausages represent a large proportion of total meat products throughput, their yields are high, and their formulae are very flexible, allowing a wide range of raw material substitutions to be carried out, both from the point of view of finding a more convenient or economic formula, or improving organoleptic quality (Saffle, 1968).

Meat extenders have been widely introduced in this type of product. Fat : cooked pork rind : broth emulsions (5:1:5) have been successfully tested in this context (Perez et al., 1979).

In this paper, results are presented on the utilization of such an emulsion in frankfurters.

Materals and methods

The emulsion was prepared with hot raw materials, with a proportion of fat: cooked pork rind: broth of 2:1:2 by weight. 2 % NaCl was added to improve keepability, and it was chilled at 2° - 4°C and stored 24 hours before use (Schut, 1976).

10, 15 and 20 % emulsion in the formula were tried, substituting for amounts of meat and fat such that protein content in the product was affected as little as possible. The order of addition recommended by Moiser et al (1979) was used in each of the 4 replicates prepared.

Weight losses were measured at each stage of the manufacture process. Yields are referred to total meat raw material in the formula.

The product was sampled for chemical analyses: % moisture (AOAC, 1980) ; % fat (ISO, 1973) ; % protein (Nx 6,25) and % NaCl (Venegas and Andújar, 1979). Texture parameters were evaluated with an INSTRON food texturometer.

Sensory evaluation consisted of a ranking test of all 4 variants by a total of 83 consumers.

Results were evaluated by analysis of variance and Duncan's multiple F tests.

Results and discussion

Smokehouse and chilling weight losses, as well as overall yields are shown in Table 1. As expected, yields increased steadily and significantly with emulsion addition.

Table 2 shows sensory evaluation results. The formula with 10% emulsion was significantly preferred, while up to 15% emulsion was equivalent in preference to the control. The variant with 20% emulsion was significantly pushed back in the ranking order.

Results of chemical analyses are presented in Table 3. The only significant differences correspond to the variant with 20% emulsion, a level apparently too high to be properly balanced in the formula, resulting in higher fat and consequently lower protein and moisture contents.

Finally, Table 4 shows results for textural properties. It can be seen that 15% emulsion gave a product quite similar to the control, albeit softer and slightly more elastic, the latter being probably due to the contribution of gelatinized rind.

Conclusions

- Up to 15% fat:cooked pork rind:broth (2:1:2) emulsion can be used in frankfurters, increasing yields on a meat base without significantly affect the product either organoleptically, chemically or texturally.

References

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Table 1 .- Weight losses and yields on a meat base. Means($\bar{x}$) and standard desviations (s)

	Control	Variants with Emulsion		
		10 %	15 %	20 %
Smokehouse weight loss (%)				
$\bar{x}$	8,81	8,92	9,95	10,16
s	1,39	1,35	1,83	1,58
Chilling weight loss (%)				
$\bar{x}$	0,39	0,70	0,70	0,90
s	0,19	0,46	0,29	0,26
Overall yield(%)				
$\bar{x}$	132,35^{a}	141,31^{b}	144,22^{bc}	148,37^{c}
s	5,39	2,57	3,27	2,22

a, b, c, Mean values without a letter in common differ at $p < 0,05$ (Duncan's multiple F test).

Table 2 .- Results of sensory evaluation

Rank order	1	2	3	4
Sample	10 %^{a}	Control^{b}	15 %^{b}	20 %^{c}

a, b, c, Mean values without a letter in common differ at $p < 0,05$ (Duncan's multiple F test).

Table 3 .- Results of chemical analyses

	Control	Variants with Emulsion		
		10 %	15 %	20 %
% Sodium Chloride				
$\bar{x}$	2,61	2,53	2,57	2,49
s	0,26	0,13	0,13	0,13
% Fat				
$\bar{x}$	23,69	24,52	23,82	29,79
s	1,13	0,99	1,32	2,12
% Moisture				
$\bar{x}$	58,57	59,03	59,03	54,87
s	1,52	0,86	0,27	0,69

Table 3 .- Cont.

	Control	Variants with Emulsion		
		10%	15%	20%
% Protein				
$\bar{x}$	13,34	13,16	13,80	12,11
s	2,00	0,66	1,06	1,93

Table 4 .- Textural properties

	Fracturability (kg)	Toughness (kg)	Elasticity (mm)
Control	3,6	5,0	12,0
10 %	2,3	3,2	10,6
15 %	3,6	3,7	13,5
20 %	2,7	3,3	10,4