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## THE QUALITY OF COOKED SAUSAGE AS EFFECTED WITH THE MICROWAVE TEMPERING OF MEAT BLOCKS

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### SUMMARY

A meat thawing procedure influences significantly the quality of cooked sausages. Microwave tempering in the preparation of raw meat allows to shorten the thawing time by 50-100 times, to prevent meat quality deterioration, to stabilize the level of bacterial load.

A comparison of the qualities of meat blocks thawed traditionally (control samples) in the air at 15°C and R.H. 90-95% or with microwaves (test samples) in the units of TPP-20 and AI-FDV types at 915 MHz and at 20 and 40 kW, respectively, indicated advantages of the test treatment over the control one. Test meat had a more resilient consistency and a more natural colour, protein denaturation changes were less pronounced. The organoleptical qualities of the test sausages were higher (a more intensive colour, lower residual nitrite - by 0.7%); the microbial load of the controls was 40% as high as compared to the test sausages. The finished product yield in case of microwave treatment was 1.5-2.0% higher.

### INTRODUCTION

Improving a technology of meat preparation for processing into sausages is an urgent task. In particular, cooked sausage quality depends considerably on meat thawing procedure. Traditional procedures using air, steam/air or liquid media have some noticeable disadvantages, viz., meat weight losses, long process duration, intensive microbial growth, possible low quality of the finished product. The application of vacuum installations allows to obtain meat of high quality characteristics, though the process time remains long (7-9 hr). Microwave treatment prevents practically meat weight losses, microbial growth, ensures warming throughout the block and shortens thawing time by 50 and more times as compared to traditional treatment.

### MATERIALS AND METHODS

Beef and pork in blocks frozen down to -18°C in the centre were used in the experiments. Microwave tempering was performed in domestic units of TPP-20 and AI-FDV types at 915 MHz and at 20 or 40 kW, respectively. The

tempering time was 15-20 min., the temperature in the centre of the block was -2±1°C. Control blocks were air thawed at 15°C and R.H. 90-95%, the temperature in the centre of the blocks reached -2°C within 20-24 hr. From the so prepared meat control and test sausages were manufactured by several formulations. The quality of the raw meat and of the finished sausages was evaluated organoleptically, physico-chemically and microbiologically.

### RESULTS AND CONCLUSIONS

The results of the organoleptical evaluation of the quality of meat blocks after microwave tempering indicated a more resilient consistency and a better natural colour of test meat as compared to controls. Test meat WHC was 4% as high as compared to control meat. Practically no drip loss was observed in case of microwave treatment, it reaching 3% with traditional thawing. The extent of meat protein changes was judged by the electrophoretic mobility of sarcoplasmic and myofibrillar proteins. Of significance was only a change in the ratio of individual fractions as compared to the initial meat; the differences between test and control samples were insignificant.

A high level of the retention of the initial properties of meat protein components during microwave tempering influences favourably the qualities of the cooked sausages manufactured of such meat. Thus, in test sausages WHC was higher, than in controls, by 3-4%; respectively, the yield increased by 1.5-2.0%.

The organoleptical evaluation of sausages revealed the advantages of microwave tempering: sausage consistency was more compact, the colour brighter. Respectively, residual nitrite in test sausages constituted 1.9%, in controls it was 0.7% as high.

Due to the fact that in case of microwave tempering the thawing time is greatly reduced, the microbial load of test samples is by 10-10<sup>2</sup> times lower than that of controls.

As far as the finished sausages are concerned, the microbial load of controls was 40% as high as compared to test ones.

The study carried out demonstrated that the application of microwaves to temper frozen meat blocks in sausage production will allow to greatly reduce thawing time, to improve physico-chemical, microbiological and organoleptical properties of raw meat and sausages, to extend sausage shelf-life.