COMPOSITION FOR TREATMENT OF MEAT PRODUCTS CASING

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The prevention of contamination of meat products, especially those not subjected to thermal treatment, or stored for long periods of time, for example, semi-smoked or smoked and cooked sausages with fungi (molds and yeasts) is a very important problem.

In literature (1,2) there is information about different chemical compounds used for this purpose, particularly, organic acids and their salts (sorbic, formic, citric, lactic acid, etc.).

The salts of sorbic acid are of special interest with regards to prevention of sausages contamination with fungi. In some countries they are allowed for treatment of foods.

As far as the wider antimicrobic action spectrum is concerned, the compositions based on antibiotics and sorbic acid have the greatest effect, but the use of antibiotics in food industry is questionable or undesirable because of the appearance of antibiotics resistant strains of microflora in human organism. Particularly, this concerns the antibiotics for medicinal purposes.

The company "Gist Bracades" (The Netherlands) produces the preparation "delvocid', the use of which for the treatment of the casing of meat products, especially raw sausages, is allowed in several countries (Russia and others).

The effective component of delvocid is the antibiotic "natamicin", as produced by the culture Streptomyces natalenses. Natamicin (pimaricin) $C_{23}H_{47}O_{13}$ is not used for medicinal and veterinary purposes which eleminates the possibilities for these microorganisms, including microscopic fungi to get used to this antibiotic.

In Russian Federation the use of aqueous solution of sodium salt of dehydroacetic acid was tested for treatment of raw-dried sausages casing to prevent mold formation on them.

At the All-Russian Meat Research Institute a new composition was developed for the treatment of the casing of sausages to prevent the development of fungi.

The created composition inhibits the development of the most of fungi yeast microorganisms, proliferating at the surface of foods and causing the loss of the general appearance and their spoilage; besides, the composition is less toxic and possesses a greater hydrofobity as compared to the known media, for example delvocides.

The composition for the treatment of the casing contains a fungicidal substance, which is a cyclic peptide and lactose in ratio 1:1.

This preparation was not used previously, therefore the biosynthesis was carried out purposefully for obtaining this preparation with the desired properties - to inhibit the fungi, having the negative influence on the quality of foodstuffs. The preparation is a cream-coloured amorphous powder, solvable in alcohol, acetone, not solvable in water, hexane. The methylated aminoacids (Iso-methyl-leucine, Iso-methyl-valine, Iso-methyl-glycine) are responsible for the neutral character of the compound and its lipophylic properties. It is stable at a room temperature during 2 years. Permitted dailly consumption - 70 mg/kg, which indicates its low toxicity.

Lactose in this composition is the means for increasing the absorption of the fungicide at the surface of the food casing.

The composition is prepared by mechanical mixing of the ingredients. The composition is a cream-coloured powder, solvable in an aqueous solution of the alcohol, acetone, not solvable in water and hexane. The maxima in UV spectrum are observed at 205 nm. In IF light the maxima are observed at the absorption (cm^{-1}): 1630, 1650, 3300. The value of optical rotation $/\alpha/_d^{20}$ = -245 (with 0.5 $CHCL_3$) and $/\alpha/_d^{20}$ = -190 (with 0.5 MeOH). The mobility in thin-layer chromotography in systems benzene-acetone 1:1 Rf = 0.1.

Iodine detection in vapours. The quantitative determination was carried out by the method of biodevelopment of chromatograms with the use of test-organism Aspergillus niger 154 as well as with the help of high perfomance liquid chromatography: UV-detector-210 nm, stationary phase C-8 (25 x 4.6), mobile phase: acetonyl-water-orthophosphoric acid 700:500:0.05.

The casings for the production of sausages such as belcosin, cutisin, fibrous, etc. are subjected to treatment. In this case the dry preparation (cyclic peptide and lactose in the ratio 1:10) was placed in the aqueous solution of salt, mixing the liquid until the uniform suspension was obtained. Then the treated sausage casing was kept in the ready suspension of the preparation during 15-20 min. The remaining part of the suspension is allowed to trickle down and the comminuted meat is formed into the treated casing. The subsequent technological process of manufacture and storage, for example raw and raw-dried sausages, are carried out according to the accepted standards.

CONCLUSION

A new composition was created in the All-Russian Meat Research Institute, which is a dry preparation for treatment of sausage casing to prevent the development of microscopic fungi in the finished products during their manufacture and storage.

References

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