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Microbiological and physico-chemical studies of the production of meat-vegetable tinned food for children.

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Recently the problems concerning the production of tinned food for children have called forth great interest among the research workers in that field.(4,5,6).The Standing Commission to the Council for Mutual Economical Aid in Food Industry took a decision to extend and carry out profound investigations of the production of tinned food for children at different ages.Special attention is paid to the hygienic and technological characteristics ensuring high quality of the production(4,6).
Sterilized tinned meat for children in People's Republic of Bulgaria are produced in a specialized enterprize.The technological processes are completely mechanized and automatized which guarantees an annual production of more than 40 kinds meat-vegetable and fruit-vegetable tins for child on with puree-like consistency.
Presenty we have aimed at carrying out detailed microbiological and physico-chemical studies of different kinds sterilized meat-vegetable tinned food for children.

Materials and methods:

50 samples from 7 kinds sterilized meat-vegetable tins for children with puree-like consistency were tested(veal with rice-9 samples, veal with apples and rice-9 samples, veal with vegetables and rice-5 samples, veal with vegetables-10 samples, veal and tomatoes-9 samples, veal with tomato juice-4 samples and veal with potatoes-4 samples).All tins were produced in 1984-85 in a specialized for that purpose enterprise.The samples were taken immediately after the ceasing of the technological process and the analyses were performed according to the requirements of the Bulgarian State Standard(2).
The microbiological studies included tests for determination of the nonsporeforming bacteria fungi, moulds, mezophylic and thermophylic spore-forming microorganisms (acrobic and anaerobic).Preliminarily all samples were put in a thermostat at 37°C for 7 days and at 55 °C for 3 days and after wards hermetically tested.
The physico-chemical studies included tests for for determination of the dry substance(in per cent), total fat and total protein content(in per cent) and sodium chloride (in per cent).
Organoleptic tests of the samples were performed according to the characteristics:appearance, colour, consistency, taste and flavour.
Laboratory analyses were carried out up to the requirements of the Bulgarian State Standard(1).The results obtained were summarized with the help of variant statistics methods(3).

Results and discussion:

The results of the microbiological tests showed that in the samples, taken immediately after the production, non-sporeforming bacteria, fungi, moulds, mezophylic and thermophylic sporeforming microorganisms(acrobic and anaerobic) were not detected.In individual samples were found to 10 spores mezophylic saprophytic acrobic microorganisms.The summarized data confirmed the efficacy of the applied sterilization regimes that ensure high quality of the tinned food.

On table 1 are given the results of zhe physico-chemical analyses of the samples, taken from all 8 kinds of tinned meat.It was established that the values of the studied indices varied within the narrow limits of the corresponding variety of tinned food as they were always in compliance with the requirements of the Bulgarian State Standard(2).The summarized data showed that the content of dry substance was from 19,5% to 27,0%, of fat-from 3,0% to 6,0%, of protein-from 2,5% to 5,9% and of sodium chloride-from 0,36% to 0,60%.
The organoleptic testing ascertained the following characteristics of the tinned food for children:a/appearance-fine homogenous puree'like mass; b/colour-one and the same for the whole mass; c/consistency-semi-fluid, like puree; g/taste and flavour-specific for the product.The organoleptic characteristics of the tested samples of tinned food for children were all up to the requirements of the Standard(2).

Conclusions:

1.In the sterilized meat-vegetable tins for children non-sporeforming bacteria, moulds, fungi, mezophylic and thermophylic spore-forming microorganisms (aerobic and anaerobic) were not detected. In some samples were found up to 10 spores mezophylic saprophytic aerobic microorganisms.
2. The physico-chemical characteristics (dry substance, total fat and protein content and sodiumchloride varied within the narrow limits of the different kinds of tinned food as they were up to the requirements of the Bulgarian State Standard (2).
3. Each variety of tinned food had specific organoleptic characteristics.

Table 1

Physico-chemical characteristics of meat-vegetable tinned food for children
(in per cent)

Type	No of samples	Dry substance $\bar{X} \pm S_{\bar{X}}$	Total fat content $\bar{X} \pm S\bar{X}$	Total protein content $\bar{X} \pm S\bar{X}$	Sodium chloride $\bar{X} \pm S\bar{X}$
Veal with rice	9	21,3 ± 0,47	4,8 ± 0,19	4,5 ± 0,07	0,48 ± 0,02
Veal with vegetables	10	22,4 ± 0,98	4,5 ± 0,15	4,4 ± 0,08	0,51 ± 0,02
Veal with apples and rice	9	21,6 ± 0,61	4,2 ± 0,19	2,6 ± 0,03	0,48 ± 0,02
Veal with vegetables and rice	5	23,8 ± 0,52	4,9 ± 0,13	5,7 ± 0,04	0,55 ± 0,02
Veal with tomatoes	9	23,3 ± 0,29	4,6 ± 0,11	5,7 ± 0,04	0,49 ± 0, 02
Veal with tomato juice	4	20,5 ± 0,73	5,9 ± 0,05	5,1 ± 0,05	0,46 ± 0,02
Veal with potatoes	4	20,7 ± 0,36	4,7 ± 0,07	5,8 ± 0,07	0,56 ± 0,02

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