

DIETETIC FLOURING SUPPLIES FOR CHILDREN NOURISHMENT

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Abstract

Is well known that the alimentation represents one of most important factor of the environment, which influence and conditionate the health of humans. If for all types of ages alimentation is an important profilactic factor, for health maintainance and also therapeutic, for treatment of some diseases, for children is the most important factor of a shapely development physical and psychical. An unproper alimentation, both deficiency and excess, reflects negatively on health and children development. The alimentation influence and develop the children psychical. Its determined, that to children who received an irrational alimentation, a decrease development of the brain activity and on speaking. One of the major problem of children nourishment is the coverage of the needs of the growing organisms with food stuff which to satisfy the qualitative and quantity necessary for energy and nutritive substances. This paper aim is the study of flouring products diversification for children nourishment, elaboration of new fabrication recipes, establishment of optimum operation parameters and identification of energetic and nutritional qualities of the products obtained, frame in actual tendency of diversification and qualitative increase of dietetic flouring products. Association of flouring food stuff with high protein value, with vegetable and fruits products which give to the final product vitamins and sugar high contribution, represents actual tendencies in children nourishment.

Keywords: dietetic flouring, children nourishment

1. Introduction

Children nourishment, as essential life factor, has to answer to the following major requirements: to assure the coverage of consumption and losses determinate by the sustenance activity and also by the self wear, to assure the impose needful activities who are evolve, to cover the nutritive needs requested by the biological process of increment and development, to realize an optimum limit reserve of nutritive substances in organism.

The child food has to contain all nutritive substances which enter in his organism structure: proteins, lipids, sugar, mineral salt, vitamins, water. All the components of children intake has to be useful, in enough proportions and well detrminated. The excses and the absence of only one of this

substances can lead to the deregulation of the entire functional condition of the children.[1]

Food stuff for children it classify regarding a few criteria, taking in count the nutritional and technological requirements. After their destination, it distinguish milk products for children nourishment and products for diversify alimentation of babies of 4 – 6 months and of little children, known also diversify food stuff. [2]

These are industrial products of vegetables, fruits and mixed (vegetables, fruits, meat) and cereals, as raw, or combined with other ingredients ready for consumption of consumable after a reconstitution with milk or water.

In children nourishment of 4-6 month these products completes mother milk.

Cereal products it classify in: dried pearled cereals, fragmented, done with water or milk through simple dilution or boiling, for babies of 6 -12 months, simple or complex flouring cereals, pasta prepared from: simple flouring cereals or addition of milk, meat, eggs, flours, protein concentrate, sweet biscuit and biscuits

Through their chemical composition, the obtained products from rice have a high biological value in alimentation, being recommended in products for children nourishment, un-gluten diet products. adsorbed to suspended matter which can be washed off into water.

2. Materials and Method

Elaboration of the mixing recipe of nutritive flours with addition of fruits have been realised regarding the caloric and nutritional contribution of flour foods and products from vegetables and fruits.

Have been choosing as raw basis material: alimentary semolina obtained from wheat coarse ground level, rice flour obtained through the pearled cereals beating, mixture of crushed dried fruits in equal proportions. Also have been introduced additives such as: antioxidants (ascorbic acid) and increase in thickness agents (starch).

It realised 4 types of nutritive flours, using different proportion of the three basis raw materials, presented in table 1.

In the technological process of the products for children nourishment is allowed only physical procedures to be used (cooling, centrifuging, pasteurization, drying) and bio-chemical (fermentation, hydrolysis), to avoid changes which will lead to nutritional qualities modifications of the compounds or to lead to noxious compound formation.

Between processing procedures the main attention must be given to thermic treatment which, when is used un-rational, can influence nutritive values and un-harmful food stuff.

The most sensible transformations to heat take place on proteins. The moderate heating improves the digestive protein coefficient utilization, especially of vegetal proteins and does not affect their biological value.

Products are well assimilated because happens a cellular membrane breakage which favour the dismissal of some valuable compounds, normally un-useful. Through heating the proteins are adulterated, their structures are modified and become accessible to digestive enzymes attack. In the same time, vegetable products, green stuff, thermic treated does not contain anti-nutritive factors which brake the growing or have toxic action.

Nutritive flouring achievement has been realized according with the technologic process presented in figure 1.

The technologic operations chosen in processing have following reasons:

- drying the mixture to a maximum temperature of 800C, for 20 minute, for removing the water excess, but without damaging the nutritive value of the final product;
- additive action through antioxidants addition (ascorbic acid) for growing of product conservation and starch addition for improvement the increase in thickness proprieties and gel formation of flouring supplies for children nourishment;
- conditioning through mixing to ambient temperature for homogenization and stabilization of final product.

The characterization of these products from physical-chemical point of view through determination of: humidity SR ISO 712, proteic content using Kjeldahl method STAS 6283/4-84, lipid method, Soxhlet method, sugars, ash determination STAS 90-1988, heavy metals (SAA) [4].

Table 1. Nutritive composition of flour for children nourishment

Raw material Sample	Rice flour (%)	Semolina (%)	Fruits mixture (%)	Ascorbic acid mg/100 g mixture	Starch (%)
I	40	40	20	50	2
II	60	20	20	50	2
III	20	60	20	50	2
IV	30	30	40	50	2

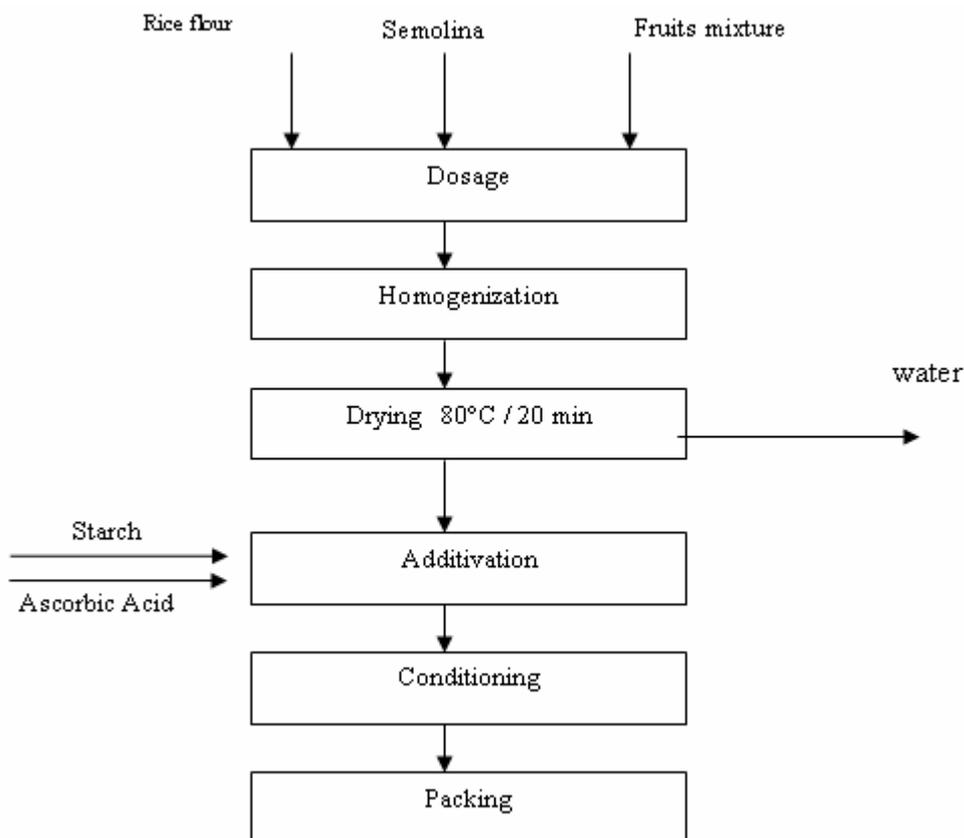


Figure 1. Technological process for obtain the nutritive flouring

Table 2. Humidity and ash content of nutritive flours (%)

Sample	Initial humidity (%)	Final humidity (%)	Ash (%)
I	13	5,0	3,02
II	13	5,4	3,24
III	10	5,5	3,84
IV	9	5,8	4,5

Table 3. Proteins, lipid and sugar content of nutritive flours (%)

Sample	Calorie	Lipid	sugar	Proteins
I	359,6	0,88	72,4	7,74
II	326,4	0,86	73,58	7,24
III	320,82	0,84	76,22	8,24
IV	295,2	0,77	77,75	6,73

Table 4. Heavy metal content of nutritive flours (ppm)

Sample/ element (ppm)	Cd	Cu	Pb	Zn
1	0,082	0,698	0,22	1,470
2	0,067	0,698	0,51	0,7379
3	0,049	0,267	0,57	1,1377
4	0,042	0,241	0,46	1,1790

Table 5. Heavy metals maximum limit in flouring food stuff and fruits

Nr.crt.	Products	Cd	Pb	Zn	Cu	Sn	Hg
1	Vegetables and fruits products for children	0.1	0.5	50	15	50	0.02
2	Wheat, flour, rice, corn, oat	0,2	1	15	5	-	0,05

The experimental results obtained to the analysis of physical-chemical parameters of nutritive flours are shown in tabels 2-4.

The initial humidity it refer to the humidity content of nutritive flours before the processing and correspond with cereal humidity from nutritive mixture composition .

The initial humidity content of nutritive mixtures is comprised between 9-13 % being given by the humidity of cereals flours, which is according with STAS, maximum 14 % for conserve in good conditions and in a small measure by the dried fruits humidity.

The final humidity, obtained for the output product, processed through drying and additive action decrease to 5 - 5,8% framing in the border of under 6%, necessary for the conservation and the preservation of final product without affect the nutritive proprieties of the product. The technological applied conditions for processing accomplish quality requirements of final product.

The mineral substances constitute food components absolute necessary for life, which concure to normal development of human activity .The ash content of nutritive flours, which give also the mineral content, is between 3-4,5%, igher values in the case of dried fruits addition.

The needed protein for children is variable in different stages of children life. The little

the child is, the high quantity of proteins is needed for one kilobody.

In the establishment of nourishment intake of children has to have in view that the proteins to cover aproximatively 15% from total caloric ration. When the protein content from children nourishment is low, the increasing and development of children are slow down, and the resistance to external agents, diminish. The proteic deficiency exert a negative influence also upon bony system.

The protein content of manufactured products is between 6,73% in the case of the sample IV and 12.1% in the case of cereal.

Correlated with energetic contribution, the needful protein for babies is minimum 1,6 g protein/100 kcal and maximum 1,9 g/100 kcal. Generally, for babies proteins must represent 7 – 16% and for little child 13 – 18% accountable to energetic contribution in diet.

The fats in children organism serve as plastic material, also as dissolvent of A and D vitamins assuring their optimum assimilation. To lipids insufficiency the children growth is retain, the organism immunity come down, skin pathology mutation appearance. Is harmful also their surplus in nourishment. The fats abuse can modify the substances exchange, aggravating the protein utilisation, compete to digestive mutation [5].

We know that the children ration is biological complete when the lipid component is not lower than 30 % from daily caloric intake. Children under 1 year old need relatively high amounts of lipids (6,5-5,5 g/kg body quantity). Nourishment ration of the children has to include 10-15% vegetable fats – sources of fatty acid polyunsaturated.

Lipid content of obtained samples is relatively constant (0,77-0,88%), with a small decreasing tendency through addition of dried fruits. Sugar represent the main source of energy in children nourishment. Glucids provide more than a half energy to the energy needed in 24 hours, presenting the peculiarity of the rapid methabolization in comparision with lipids and protids.

Ussually, the sugar insufficiency it associate with caloric poorness, which lead to overweight. A glucid excess in children nourishment bring a decrease of the necessity of other nutritive compounds (protein, lipids), which negatively influence the organism vital activity.

Reduced sugars content grows through addition of dried fruits, values being between 72,4-77,75%.

Through addition of fruits in children nourishment lead to growing of pectin substances contribution, with special physiological role. The diet rich in pectin substances modify in a favourable way intestinal microbial flora, inhibiting putrefaction flora, absorbtion capacity of toxic substances in organism.

Nutritional pectin is well accepted by children, having emollient action which does not affect thin intestinal functions.

Fruits are an excellent source of vitamins, carotenoid, C vitamins, K vitamins and folic acid, acid folic and carotenoid necessary for little child being covered only through vegetables and fruits consumption.

The modern nutrition recomandation forecast that the glucid ration of children to be constitute in proportion of 75% from complexe glucid in fruits and only 25% from refined sugar. The glucid necessary

from children ration is apoximatively 50 % from total calories.

The energetic value, respectively caloric content have been calculated for each mixture through summation of caloric content from lipids, sugars and proteins, taking count the following composition : 1g lipids = 9 kcal, 1g proteins = 4 kcal, 1g glucids = 4 kcal, obtaining values between 295,2 kcal-359,6 kcal.

Cereal products introduction in children nourishment assure a nutritional and caloric contribution needed for this population category [2].

Presence of heavy metals

Food stuff contains different metals with physiological role well defined: iron, cooper, cobalt, nickel, manganese etc. Concentration grows upon normal level has a negative influence on quality, can decrease nutritive value, stability, damaging sensorial qualities. In some cases products become improper for consumption, because have toxic action on human organisms.

Presence of heavy metals in children products is settled through hygiene standards elaborated by Health Minister Order 978/1998 (table 5).

Heavy metals content of analysed samples is under maximum limit allowed foresaw in STAS for flouring products, vegetable and fruits (table 4).

3. Conclusion

The experimental results obtained regarding the technology of obtaining flouring products with addition of fruits for children nourishment lead to following conclusions:

1. mixture IV with a composition of 30% rice flour, 30% semolina, 40% dried fruits, represents the optimum receipt which assures the optimum energetic necessary and the nutritional contribution for the little child ;
2. the fruits addition in proportion of 40% leads to the increase of nutritive value of product and of carbohydrates contribution, contribute to application of modern nutritional recommendation in children

nourishment, recommendation which foresaw the increase of natural glucids contribution since 25-28% to 45% from energetic ratio and the corresponding decrease of raffinate sugar contribution ;

3. Protein contribution and the necessary essential amminoacids are assured by cereal flours (rice and wheat semolina);

4. Lipid, protein, glucid content and energetic value/100 g product frame in nutritional parameters necessary for children nourishment;

5. The technological process parameters have been establish to assure the optimum quality of the final product, humidity 6%, ash content maximum 4%;

6. Heavy metals content of the samples is below maximum limit allowed by Grade Standards.

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