Additives used in flour pasta fabrication
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Abstract
The nutritional additives find their utility within the flour pasta fabrication. The role of the nutritional additives in the flour pasta industry is a: preservative, antioxidizing, acidifier, emulsifier, flavour potentiator, and/or acidity corrector.

Keywords: Nutritional additives, flour pasta, fabrication.

1. Introduction
The flour pasta, a nutritive with a simple receipt, is appreciated by consumers for its organoleptic characteristics, nutritive value, preservation, simplicity and security in use.

The multiple already existing products on the market and also the requirements more and more sophisticated of the consumers have challenged the flour pasta producers to attempts in order to obtain some quality products of a striking appearance, that could be preserved for as longer periods as possible.

As in the whole food industry, in the flour pasta case the nutritional additives were made necessary.

2. Debates
Not all the nutritional additives are allowed to be used in flour pasta fabrication. Those which are allowed to be used are structured on the following groups:

a) preservatives – substances that prolong the preservation period of food by protecting them against the pravity produced by microorganisms: Calcium ascorbate (E302).

The ascorbic acid is included in the substance category which is deemed as non-hazardous and which is normally met in the food composition in natural status. This acid acts as an obstacle against bacteria of Clostridium type, anaerobic bacteria which are usually responsible for the pravity of the products vacuum wrapped or wrapped in the protected atmosphere. At the flour pasta fabrication, the ascorbic acid is introduced as an ascorbate of potassium, sodium and calcium (its salts). The calcium salt of the ascorbic acid (vitamin C, a natural acid) which is naturally found in most fruits and vegetables. In pasta industry it is used in quantities of 1g/kg of pasta. The advantages of the ascorbic acid use are: resistance to overboiling for pasta of a weak texture flour; the reduction of proteins and solid substances loss due to products’ boiling; the decrease of the boiled pasta agglomeration degree at an admixture in a proportion of 5-30 mg%; at an admixture of 200-250 mg of ascorbic acid at 1 kg of flour there is noted the stability of the natural colour and the colour obtained by carotenoid addition; it diminishes the kneading and ameliorates the technological behaviour of the unmatured flour.

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b) **antioxidants** – substances which prolong the preservation period of food by protecting against oxidation (for example: the rancid turning, the colour changing)\(^2\): L-ascorbic acid (E300) and the sodium ascorbate (E301).

**L-Ascorbic acid** is the most important natural antioxidant (vitamin C). It is present in nature. It is known as being used in small quantities, with a beneficial effect on gluten and as a consequence, it leads to the reduction of pasta clamminess and the improvement of their stability on boiling. It was used on a large scale at pasta production in the European continent, especially in South-East Europe where the white flour is used as a basic substance. In Italy, the use of vitamin C is allowed only for fresh pasta. The consumption of L-ascorbic acid is considered non-hazardous.

c) **acidifiers** – substances which grow the food acidity, giving them a sour/acid taste\(^2\): citric acid (E330) and tartaric acid (E334).

**The citric acid** is naturally present in citric fruits; it is used in the food industry as an acidifier and antioxidant. It is allowed in pasta production in a dosage of up to 0.25%. It is used under the shape of the calcium, sodium and potassium citrate.

**The tartaric acid** is an acidifier used to reduce the pH of the fresh pasta, acting as an obstacle against the microbial development. It is allowed in dosages of up to 6 mg/kg of body after WHO, while other forums believe that it may be used in unlimited quantities. In nature is found especially in grapes and thus in wine.

d) **emulsifiers** – substances which make possible the formation and maintenance of an homogeneous mixture between two or more immiscible phases as might be oil and water in food products\(^2\): lecithin (E322) and mono- and di-glycerides (E472).

**Lecithin** is the natural constituent of oils and food fats. Although the main function is that of emulsifier, it may act as an antioxidant agent.

**Mono- and di-glycerides.** They are components found in egg. The use of the whole egg is preferable and in fact superior from the technological point of view taking into account that additives are only a surrogate. At the addition in the basic substances, these additives contribute to the formation of certain chemical connections which lead to a bigger elasticity and resistance of gluten. However, this role may be fulfilled with the same success by eggs, which bring in addition the advantage of a substantial increase of the nutritive value of the products.

From a healthy point of view, mono- and di-glycerides are not considered hazardous. WHO has determined the maximum allowed dosage to 125 mg/kg of body weight.

e) **flavour potentiators** – maintain and amplify the specific flavour of the aliment:

**The monosodium glutamate (MSG)** – the daily admissible dosage determined by WHO, is of 120 mg/kg of body weight, which would include it in the category of the non-hazardous additives from a healthy point of view. The glutamic acid which monoglutamate derives from, is an amino acid which enters the composition of many animal and vegetal proteins.

f) **acidity correctors** – substances which modify the acidity or alkalinity\(^2\): citric acid (E330), sodium citrate (E331), potassium citrate (E332), calcium citrate (E333), acetic acid (E260), lactic acid (E270), sodium lactate (E325), potassium lactate (E326), calcium lactate (E327), glucono-delta-lactone (E575).
The lactic acid: is an acidulant which is used in the complex ameliorators’ composition for its properties: preservation agent – prevents the development of the undesired microorganisms (bacteria, moulds) which adulterate the quality of the food products. It positively influences the technological properties of the dough products and also contributes to the printing of finite products’ taste and flavour.

The use of synthetic dyes in flour pasta is not allowed.

β carotene is the preferred carotenoid for flour pasta colouring; this carotenoid increases the nutritive value of the product, being accepted as a nutrient in it, and it has a provitamin A activity.

Certain documentaries mention tartrazine (E102) as being an egg substitute, at the flour pasta fabrication. Tartrazine (E102) is a yellow food dye which is very soluble in water. It’s in fact an azoic synthetic dye.

It is obvious that the current legislation regarding the additives used in food products do not include tartrazine on the list of accepted additives used at the flour pasta fabrication.

Moreover, other studies certify that its use might cause side effects: urticaria at children, sight problems, allergies to persons being allergic to aspirin and breathing problems; studies continue in respect of determining the noxious effect of tartrazine.

3. Conclusion

The advantages of the additive use at the flour pasta fabrication are first of all technological, the preservation of the finite product and offers the manufacturer the possibility to establish smaller prices for the finite product.

Reference

Milatovic L. –La vitamina C nella tecnologia dei cereali – Editura tecnica Militoria, 1976

Milatovic L. – The Use of L-Ascorbic Acid in Improving the Quality of Pasta-International Journal for Vitamin and Nutrition Research nr. 27/1985


*** Ord. MS no. 975 from 16 December1998 regarding the approval of the Hygienic and Sanitary Norms for food

***www.apc-romania.ro

***http://www.food-info.net/ro/e/e302.htm