FOOD PRODUCTS AND THE WAYS OF PROTECTION FROM VIRAL DISEASES

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Abstract: Food products may represent (under certain conditions) a serious danger for the health of people in the following situations: the initial state of products (bacterial, viral, toxic contamination), environment and some types of fish of World Ocean; violation of terms of storage (temperature, length of storage, etc.), violation of thermal treatment rules (storage terms reduction, etc.). This article brings some information of how we could protect from viral diseases.

Keywords: food, virus, biologically active substances, etc.

In this connection a considerable danger to the health of the people represent raw and insufficiently thermally treated food of animal origin, fruits and vegetables contaminated with faeces – these are fish, raw shellfish, oysters containing biotoxins.

In contrast to bacteria viruses cannot be reproduced in food environment, food products, but are reproduced only in living cells of men and animals.

Depending on the symptoms of deseases viruses transferred through food products may be divided in following groups: activators of gastroenteritis (gastrointestinal tract diseases), activators of intestinal viral hepatitis A (HAB), located and reproduced in liver, viruses reproduced in intestines provoking diseases after migration into other organs (nervous system).

Thus entheroviruses cause gastrointestinal diseases and viral hepatitis which possess high infectious activity and may be transferred from one person to another and through viral contamination of food (secondary food infection) /1, 2, 3/

In the Table 1 there are indicated the sources and characteristic viruses of food products which cause infectuous diseases.

Table 1. Viruses trasferred through food

Virus type	Sources	Stability	Type of disease
Rothaviral gastroentheritis	- people - water food: vegetables, milk and milk products, etc. - domestic	- environment (up to 1 month) - running water (t-20-40°C, up to 2 months) - vegetables (t-4°C), up to 30 days	- gastrointestial tract diseases

Virus type	Sources	Stability	Type of disease
Hepatitis A virus	- fish, mussel, shellfish	- environment (t-4°C – for months) - (t-20°C – for several years) - reservoirs (for 12 days, 10 months, t-10°C) - chlorinated water (30 min) inactivated while boiling in 5.0 min - ultraviolet radiation in 1.0 min	- Botkin disease - jaundice
Entheroviral non poliomyelitis infections (ECHO, Koksaki)	- man - meat, vegetables - fruits - water - eggs	Virus is stable: - at freezing - in ether - in 70% spirit solutions - at low temperatures Inactivation: - t = 50°C - drying - ultraviolet radiation - chlorine containing preparation	- meningitis - myocarditis - gastrointestinal tract
Aphtous virus	- meat and meat products of ill animal - milk products - vegetables, water, milk, eggs	Virus is stable: - at freezing - at drying Inactivated: - at heating - ultraviolet radiation - under disinfectant solution in 30 min - while boiling – in 5.0 min	- pneumonia - myocarditis - sepsis
Norovirus	- shellfish - ostrages - water	Virus is stable towards: - spirits - detergents Inactivated: - at heating - by treatment of chlorine containing preparations	Gastrointestinal tract disorders

Data from *Table 1* show that practically all types of viruses pollute the main food products: meat, milk, eggs, fish and milk products and are quite stable preserving activity in different environments at different temperatures (from 4°C up to 50°C) during several months (hepatitis A virus).

According to the above mentioned protection of food products from viruses invasion is needed to be implemented by the way of keeping to certain measures: temperature, technological and also usage of biologically active substances of some food products capable to protect the body and strengthen immunity:

1. Temperature measures consider:
2. heat treatment of food products to be implemented according to their properties but necessarily with reaching temperature inside product up to 90°C.
3. Preserving temperature regime and length of pasterization of some food products depending of their type:

at t = 63°C during 30 min.; at t = 70°C during 2.0 – 3.0 min.

Technological measures in special cases and scales include:

- thorough washing of food products using ultraviolet radiation, ozone which however have limits (lack of access inside the product);
- decrease of pH to the amount of less than 3.0 (by way of pickling, preservation) which in some cases may influence over taste quality of a product;

1. Biologically active substances of some food products (Table 2) to which refer: - flavonoid, vitamins, vegetable oils, enriched with polyunsaturated fat acids as well as vegetables and spices, which can protect the organism from viruses and slows down their spreading in tissues, as well as increases immunity to them.
2. It is necessary to underline significance and role of some combinations: folic acid, flavonoids, vitamin E, some proteins, etc.
3. In the Table 2 there are some biologically active substances and food products, containing them, and also their role in fighting against viral diseases.

Table 2. Protective role of some biologically active substances from viral invasion in food products

Biologically active substances	**Spreading in food products**	**Action over organism**
Flavonoids	Grapes, fruits, vegetables with bright colour: quince, apple, green tea, apricots, peaches, current, red wine, green tea (tea catehins)	- inactivate herpes virus; - protect organism from free radicals; - normalize cell function; - protect it from DNA damage;

Biologically active substances	Spreading in food products	Action over organism
Vitamine E	Vegetable oils: soy oil, sunflower oil, nuts, red fish, etc.	- protect from cancer diseases; - prevents infection of upper airways; - forms prostoglandin; - takes part in cell's formation; - restores DNA; - food insufficiency stops growth; - damages viruses and pathogenic organisms.
Vitamin B9 (folic acid)	Spinach, green vegetables with leaves, some cytric, legumes, coarse grinding bread, liver, honey	
Capsoitin	Hot pepper	

Thus the examples of some food products may represent a real danger for people's health. Presence of viruses in food products confirmed the fact, that practically all groups of main food types (fish, meat, molluscum, milk, mussels, vegetables, eggs, water) contain viruses capable to cause serious diseases of intestinal tract, liver and acute respiratory diseases.

The most widespread viruses of food products are rota-viral gastroenteritis, hepatitis A virus (causing Botkin disease), aphtous virus, etc.

Prevention of spreading of viral infections thrugh food products is achieved by observing certain temperature, technological conditions and using products containing effective biologically active substances which strenghten immunity system.

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