

NATURAL QUALITY, A CONTROVERSIAL CONCEPT IN PUTTING TO GOOD USE VEGETABLES, FRUITS AND GRAPES

CALITATEA NATURALĂ, UN CONCEPT CONTROVERSAT ÎN VALORIFICAREA LEGUMELOR, FRUCTELOR ȘI STRUGURILOR

BECEANU D.

University of Agricultural Sciences and Veterinary Medicine Iasi, Romania

***Abstract.** The terms of product or natural quality are often used or associated, in the conditions of the existing laws, without having a real justification. We must mention that not always a strictly natural product is healthy and hygienic, a thing that is taken into account by the sanitary legislation and expertise at national and European level. Food safety imposes certain rules, procedures and technologies that are necessary to prevent or fight against the potential inherent risks of a certain natural product. Thus, we may assert that not everything is healthy is also natural and not everything is natural is healthy, too.*

Key words: organic, ecological, contamination, food security

***Rezumat.** Termenul de produs sau de calitate naturală sunt adesea vehiculați sau asociați, în condițiile legilor existente, uneori fără a avea acoperire reală. Trebuie precizat că nu totdeauna un produs strict natural este igienic sau sănătos, lucru care este avut în vedere de legislația și expertiza sanitară la nivel național și european. Siguranța alimentară impune anumite reguli, procedee și tehnologii care sunt necesare pentru a preveni sau combate eventualele riscuri inerente unui produs natural oarecare. Putem afirma deci, că nu tot ce este sănătos este și natural și nu tot ce este natural este și sănătos.*

Cuvinte cheie: organic, ecologic, contaminare, siguranța alimentară

MATERIAL AND METHOD

After Johannesen and Torp (2005), the control of food safety in the field of ecologic products focuses mainly on the management of the bacteriologic risks and those coming from mycotoxins, respectively.

RESULTS AND DISCUSSIONS

A correct administration of organic garbage and wastes constitutes the basic requirement for an adequate fertilization. The green fertilizers and the house garbage contain frequently microorganisms dangerous for the human health. In the USA, fertilization with manure is admitted differently according to the level of composting and the ecologic destination of the crop. It is compulsory to administer the composted waste at least 120 days before harvesting or, in the case of products that have no contact with the soil, at intervals of at least 90 days. As a safety

measure, it is recommended the incorporation of manure since autumn for the early cultures.

They have noticed concretely that the vegetables cultivated on the fertilized soils with manure are contaminated with pathogen bacteria such as *Salmonella* and *Escherichia coli*. A head of lettuce may contain these microorganisms including in the tissue interior. Other studies did not notice the presence of these infection factors, though the soil was contaminated. The contaminated soil particles adhering to products by direct or indirect contact may lead to the contamination of vegetables. For these reasons, it is necessary to treat as well as possible the natural fertilizers. Composting is the most recommended measure to prevent and fight against bacterial contamination.

After Petrescu C. (1997), compost has multiple advantages not only in terms of complexity and availability in nutritive elements but also due to the melioration effect of the soil characteristics. At the same time, they notice a relatively complete elimination of pathogens, parasites and weed seeds. The necessary condition is the correct effectuation of composting by aerobic decomposition in the presence of some specific microorganisms at certain moisture and proportion between C and N. Temperatures may go up to 65°C inside the composting space (pile, silo, stack or specific recipients). The increase of temperature at more than 55 °C must last for at least 2 weeks in natural conditions, 3-5 days respectively for special spaces. There occurs the thermal destruction of the mesophile pathogen bacteria without the disappearance of the viability of sporogenous forms. Some studies have noticed even temperatures of 70°C in certain arranged composting systems that lasted up to 70 days without decreasing below 55°C. The natural systems may not achieve such temperatures due to the airing and homogenization, and values differ a lot being lower at the exterior. For this reason, special arrangements destined for composting are the most recommended. Some studies also highlighted the role of a microflora antagonistic to the pathogen bacteria and active even at more reduced thermal values. In these situations, the initial load of pathogen germs in the garbage also matters. The organic (biologic, ecologic) agriculture systems keep and preserve the microflora from soils and this becomes antagonistic towards the potential pathogen germs for the human being. They quote the case of the species *Pseudomonas* and other rhizosphere bacteria that are stimulated by the organic fertilizers, but they are hostile to the presence of some pathogen factors such as the bacteria of *Salmonella*, *Escherichia coli* and *Listeria*. It is considered that the storage of garbage for a period of time in conditions of anaerobe decomposition has the advantage of shortening the transformation period but involves a higher consumption of manpower.

After Johannesen and Torp (2005), the sowing technologies may also influence the survival of bacteria pathogen for the human being in soils, especially those of *Escherichia coli*. It is considered that there are advantages and disadvantages both in the conventional fertilization systems and in the organic fertilization ones. For the latter category, it is highly important to avoid the contamination occasions during the entire flow (pathogen agent free equipment and

endowments, the prevention of animal access to vegetable cultures, adequate sanitary arrangements for workers and especially clean water). The use of manure and organic wastes represents a risk factor if they do not comply with the existing and necessary rules and indications.

After Derache Ph. and collaborators (1986), the contamination with molds and the appearance of mycotoxins is correlated to certain environment conditions such as temperature, the moisture content and the chemical composition of products and the climatic conditions, respectively. Some species of *Fusarium* are more frequent in the periods with warm and moist climate, but they do not develop at temperatures below + 15°C. Other types of molds prefer colder climatic conditions that appear during autumns, regardless of the moisture degree.

Though most papers do not have as object the cereal infestation (molding with *Fusarium*), at present there are more and more contributions referring to the potato tubercles, apples and other fruits, respectively. If in the papers existing so far, they focused on the annual cultures, studying the effect of culture rotation and the presence or absence of pesticides to prevent and fight against, at present they publish more and more papers evaluating the risk of appearance of mycotoxins in the multi-annual and perennial cultures.

For the annual cultures, they consider that the rotation systems contribute significantly to the avoidance of microbiologic contamination. Regardless of the types of cultures, the harvesting and storage technologies are highly important. Without diminishing the importance of the harvesting years that may favor or create favorable conditions for the development of molds generating of mycotoxins, we may say that the harvesting and manipulation – transport technologies have, regardless of year, an at least equal relevance.

Fruits and vegetables are covered by the spores of numerous micromycetes that lay at the bottom of diverse moldings and putrefactions when the harvesting and storage conditions favor this phenomenon. In numerous cases, the fruits and vegetables attained by these pathogens are eliminated by sorting, but there are situations when the technology does not succeed totally to remove these sources of mycotoxins, the most often case being the processing of the raw material to obtain the apple juice.

After Segal B. and collab. (1986), patulin accumulates in numerous fruits and vegetables such as apples, pears, peaches, apricots, cherries, grapes, tomatoes etc. It may pass into the processed products such as fruit juices, mentioning concentrations up to 1 ppm/kg (in the USA, Canada, Germany, for the apple juice). They also mention the apples from storehouses (especially those kept in domestic conditions that contained patulin in more than 50% of cases).

Patulin is produced by *Aspergillus* and *Penicillium*, and the patulin content is regarded as an indicator for the apple quality. This antibiotic is not as toxic as it may be carcinogenic. The WHO recommends a limit content of 50µg/L in the apple juice. EU limits the patulin content at the same value, both in the apple juice and in cider.

Bonny Sylvie (2006) considers that the organic products may have a potential risk for health due to the pathogen bacteria coming from the insufficiently fermented composts. She also mentions mycotoxins, such as patulin, in the same risk category.

Prof. A. Trewavas (University of Edinburgh, UK) from the biochemistry department mentioned that mycotoxins from foodstuffs, coming from the contamination with micromycetes, contribute to the increase of the number of cancer cases in Europe. *Patulin* is one of these being often associated to the organic products. The impossibility to use effective fungicides in the organic farms led to the creation of genuine “archives” or collections of existing diseases. The organic farms must be protected against all contaminations’ effects because they are surrounded by conventional farms that use adequate fungicides.

CONCLUSIONS

1. Food safety related to the ecologic (organic, biologic) products has a specificity underlined by numerous authors that insist on certain aspects insufficiently solved. Only the products obtained in conditions of total and real compliance with the recommended harvesting technology might be considered safe.

2. One of the debatable aspects represents the contamination with pathogen germs coming from inadequately fermented compost (cases more or less frequent) or obtained from dejections (wastes) that should not be accepted.

3. The second controversial aspect is the existence of mycotoxins, often in dangerous concentrations, a presence that could be confirmed by the labs capable to effectuate these difficult determinations, especially in the case of organic (ecologic, biologic products) whose offer on the market is not very important.

4. Food safety of these products does not depend only on the compliance with technologies, but also on their improvement, since they have not managed so far to efficiently prevent and fight against the diseases from this sector, including from the economic viewpoint.

REFERENCES

1. **Beceanu D., 2009** - *Aspects of food safety correlated with conventional or ecological production technologies*. Rev. Cercetări agronomice în Moldova, nr. 1.
2. **Johannesen Gs și Torp M, 2005** – *Improving the safety of oranics vegetables* Woodhead Publishing Limited. Cambridge England.
3. **Lixandru Gh. 2006** – *Sisteme integrate de fertilizare în agricultură*. Edit. PIM Iași
4. **Mc Leod J., 2007** – *Organic gardening*. Edit. H. F. Ullmann, China.
5. **Mihale Denisa, 2007** – *Igiena alimentației. Nutriție. Dietoterapie și compoziția alimentelor*. Edit. Medicală Oradea.
6. **Moake M și colab. 2005** – *Comprehensive Reviw of Patulin conrol methods in food*. Comprehensive reviews in food science and food safety. Vol. 1.
7. **Munteanu N. și colab., 2008** – *Bazele tehnologice ale legumiculturii ecologice*. Edit. Ion Ionescu de la Brad, Iași.
8. **Munteanu N. și colab., 2008** – *Ghid de bune practici. Modele de conversie la producția legumicolă ecologică*. Edit. Ion Ionescu de la Brad, Iași.