

THE SCIENTIFIC RESEARCH OF HORTICULTURAL PRODUCTS AT THE BEGINNING OF THIRD MILLENNIUM

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Abstract

This paper presents the current state of preservation, processing and marketing) of the horticultural products sector in Romania, and measures of recovery and development policy both for scientific research and production.

Keywords: horticultural products, scientific research.

1. INTRODUCTION

A very important component of the horticultural sector on the producer-consumer chain is the processing of fruit and vegetables on a superior level. Knowing the strategy of developing this complex process is essential.

The strategy of processing horticultural products refers to:

- adequately placing objectives for conditioning and preservation;
- commercializing fresh and processed horticultural products
- mechanization and automatising of production processes, modernizing existing technologies and developing new technologies and techniques for packing products
- developing unconventional technologies and biotechnologies while protecting the environment
- creating new methods and techniques for quality control for fresh and processed horticultural products
- conducting studies and multidisciplinary research that efficiently contributes to solving these problems, all of them with the purpose of ensuring the safety of alimentation for the population.

2. THE CURRENT SITUATION OF THE PRODUCTION SECTOR

In the years following the changes from 1989, this production sector has known a strong downfall. In 1989 there were over 100 modern deposits in Romania, summing a storage capacity of 870.000 tons, (Figure 1) and in canned fruit and vegetables production reached 350.000 – 400.000 tons (figure2).

By 2007 storage capacities did not surpass 80.000-100.000 tons (mostly deposits specialized in storing apples and potatoes), and canned production was at about 100.000 tons, depending on the agricultural year (in 2006, canned production reached 160.000 tons, while in 2007 canned production did not exceed 40.000 tons, as a result of lack of raw materials, due to the drought).

According to statistical data provided by “Romconserv” , tomato paste production has been cut down the most, reaching 500-1.000 tons in 2006, as opposed to 1989, when production summed up to 80.000 tons, of which 30.000 tons were sold in the country, and the rest exported (Figure3). Currently, the consumption of tomato paste made in Romania is inexistent, the market being overwhelmed by Chinese products.

The prices of canned fruit and vegetables have risen in the year 2007 by 30-50%, as a result of increased prices for raw materials.

In the past 10 years, the consumption of canned vegetables and vegetable products – meaning vegetables (fresh, canned by sterilization, frozen, dehydrated) was relatively constant, on average being between 2507.2 thousand tons and respectively 2711.6 thousand tons/year/population. This consumption was covered by own production and import.

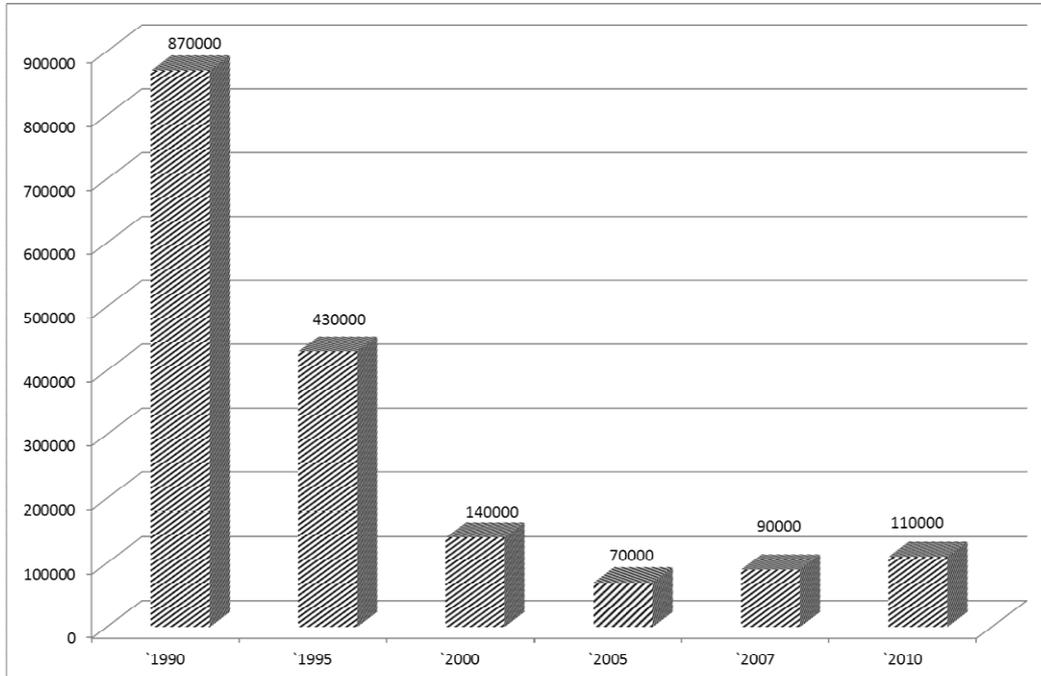


Figure 1. Storage capacity

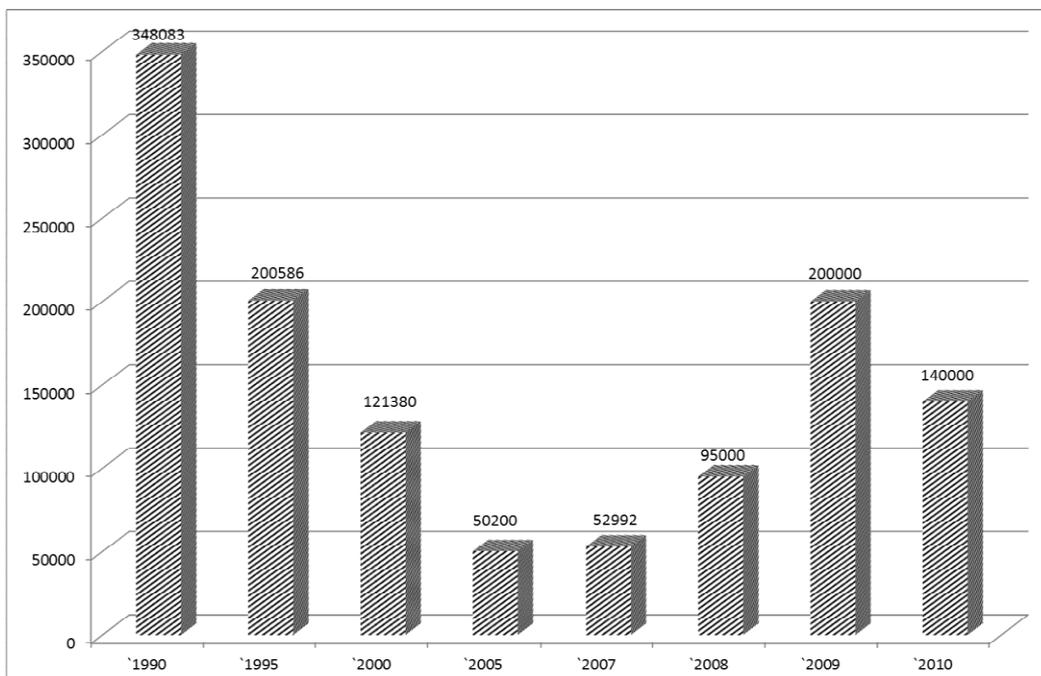


Figure 2. Canned fruit and vegetables production

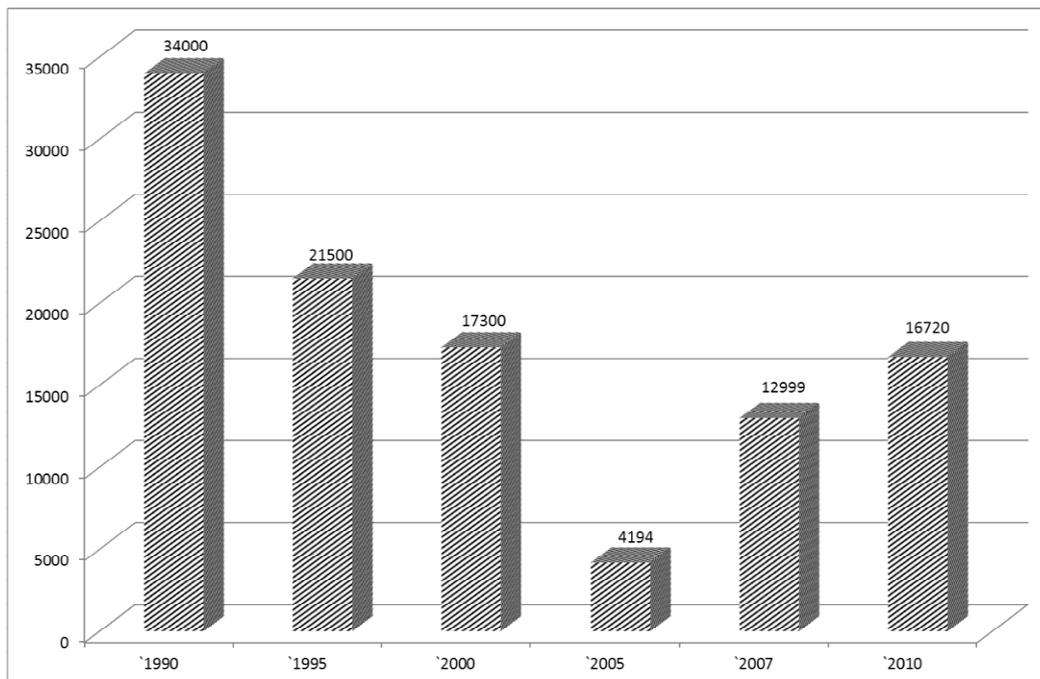


Figure 3 . Tomato paste production

3. SCIENTIFIC RESEARCH ACTIVITY IN THE FIELD OF PROCESSING HORTICULTURAL PRODUCTION

The activity of the Research and Development Institute for Processing and Marketing of Horticultural Products – HORTING, aims to solve research, design, experimental production and commercializing objectives in the field of processing horticultural products and enlists itself in the fundamental objective of stopping the decline of Romanian horticulture and assuring the conditions of re-launching horticulture and the food industry, according to:

- the natural, economic and human potential that Romania has
- demands regarding ensuring the security of alimentation for the population
- the necessity to create availability for international economic exchanges
- the need for the stability of Romania in the European Union

The research activity is fundamental, and is oriented towards the following:

- conditioning (sorting, calibrating, packing) and keeping horticultural products fresh
- processing horticultural products (canned fruit and vegetables, natural juices, dehydrated and frozen products)
- packing, transportation, mechanization, organization and economy of processing horticultural products
- cultivating vegetables in greenhouses and the value of production

4. THE INSTITUTE'S ACHIEVEMENTS DURING THE PAST YEARS

Current activity is found in the research projects over the past five years in internal and international programs: 3 projects in the AGRAL Program, 2 projects in the CALIST Program, 6 projects in the CEEEX Program (Modules I, III and IV), 2 projects in the Sectorial Program, 2 CNCSIS grants, 2 PN II projects, 2 international projects ran as activities coordinated by the institute or in partnerships with universities, research and production units in the country and abroad: Italy, France, Greece, Belgium, Israel, Holland, Turkey, Spain.

- The institute has 24 active researchers who work in different research programs. The total contract value over the past 5 years was of 4.3 million lei, of which 1.7 million lei in 2008 (figure 4).
- Based on the research, synthesis studies, standards, technologies, as well as presentation manuals for the new products have been developed.
- On account of reaching 40 years since being established, the institute organized a scientific anniversary event, presenting the main accomplishments throughout this period, and took part in many internal and international scientific events organized by other institutions, with the purpose of spreading the results of its own research in the production sector.

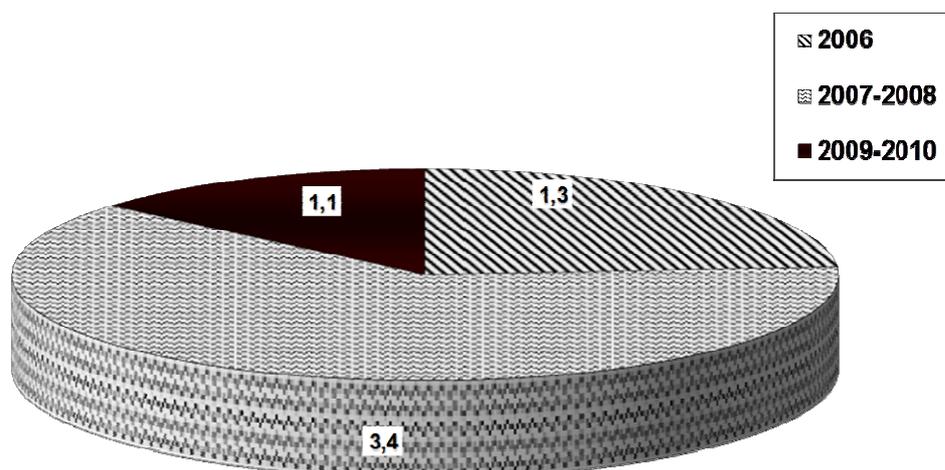


Figure 4. The value of contracts

5. THE MAIN DIRECTIONS OF RESEARCH-DEVELOPMENT IN THE NEXT PERIOD

The theme plan for ICDIMPH - Horting was developed according to the National Strategy of Research-Development-Innovation, defined by Law nr. 217/2007, approved by ASAS and forwarded to MEC and MADR. The main directions for research-development are:

- obtaining new products from vegetables and fruit for vulnerable consumer groups and developing new technologies (new hypoglycemic, hypocaloric, nutraceutical and therapeutic products);
- elaborating and revising quality standards of fresh and processed horticultural products, and the norms regarding quality and processing of horticultural products by aligning them to the European Union guidelines (39 norms regarding the nature, content, fabrication, quality, packing, labeling, marking, storing, depositing and transportation of products processed from fruit and vegetables, as well as 36 Romanian-SR standards of commercial quality for fresh horticultural products);
- developing a management system for the quality of food products, based on assessing the chemical, biochemical and microbiological risks (*Guide for developing the management system regarding security-sanitation of food products*);
- testing behavior during processing for homologation of 150 new varieties and hybrids of vegetables and 15 varieties of fruit);
- developing marketing studies, organization and economic efficiency in processing and commercializing horticultural products (7 market studies and 9 feasibility studies);
- prolonging the duration of preservation of excessively perishable and very perishable fruit, by managing the risk factors that act pre and post harvesting;

- describing biological material with regards to quality and to preservation capacity for apple and pear varieties which are resistant to diseases, with the purpose of selecting new varieties useful for ecological culture;
- modernizing and optimization of technologies specific to dehydration of horticultural products
- organizing a specialized laboratory for evaluating the quality and safety of the agro-alimentary raw materials and of food products;
- research regarding the development of an integrated system of ecological production in horticultural greenhouses, formed using aquaculture as a source of nutritive substance in vegetable culture;
- finding alternatives to using methyl bromide for soil disinfection for cultivating vegetables in protected areas;
- finding ways of protecting the ozone layer, European project (FP6 – coordinated by France), in which Horting is one of 9 partners (along France, Italy, Greece, Belgium, Israel, Holland, Turkey, Spain);
- supplying equipment in regards to obtaining accreditation for the chemical and biochemical analysis laboratory of the Institute;

The institute proposes to study the following themes in the domain of processing horticultural products:

- testing new vegetable and fruit varieties and hybrids, from a technological and nutritional value standpoint, for finding optimal ways of processing;
- promoting new competitive varieties for consumption and industrial processing, for adding in the official catalogue of varieties cultivated in Romania, based on production and ease of processing criteria;
- extending processing to new natural ecological resources (species and population of plants from the spontaneous flora, the least cultivated one in our country), for diversifying ecological food products with high nutritive qualities;
- developing new vegetable and fruit products and promoting them for a correct alimentation, according to the nutritional requirements specific to different age groups and different diseases;
- mentioning and implementing new alternatives to using methyl bromide for soil disinfection in greenhouses;
- developing non-polluting technologies for greenhouse cultures by using integrated combat methods (resistant soil, pesticides with low persistence and selective towards the useful micro-flora and fauna, biological combat);
- research regarding obtaining ecological greenhouse and biomass vegetables in a super-intensive symbiotic system with the recirculation and auto-purification of the water;
- deepening the metabolic processes that take place in fresh horticultural products after harvesting and during commercialization (package-product relationship), for maintaining nutritive value;
- accreditation of modern laboratory methods for analysis and determination of nutritional components of fruit and vegetables;
- finding methods and techniques of optimization and computerized control over storage factors, with the purpose of reducing losses and increasing storage duration and reducing energy consumption;

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