

RESEARCH ON THE DEVELOPMENT OF CONSERVATION TECHNOLOGY OF CUCUMBERS

Minerva Heitz*, Elena Ștefănescu**, A. K. Heitz*, Elena Liliana Milovici**, Aurelia Radu*

*The Resort of Research and Development from Iernut, Energiticianului str. 1A, Iernut, Romania, 545100

**Research and Development Institute for Vegetable and Flower Growing Vidra
elenastef14@yahoo.com

Abstract

The activity of vegetable processing has been a necessity in turning vegetable that could not be recovered economically. First it was vegetables that were eliminated through the multiplication of cultivars, helped by the method of maintenance, since they were outside the ranges of confidence. Also, often, large amounts of fresh vegetables produced in the development sector for exploit, had no buyers or the prices were unprofitable. This gave rise to the decision to carry out the vegetables processing.

Key words: conserve, acid acetic, Cucumis sativus

INTRODUCTION

Storing vegetables in different ways (Radu I.F., 1971): freezing, drying, pasteurization, etc. To supplement the intake of vegetables for food, especially during the winter months, has become a necessity both in our country and abroad.

At The Resort of Vegetable Research and Development from IERNUT which is engaged in multiplication of some varieties through the seed production obtained from upper links, and improving and creating new varieties and also existed the vegetable conservation which could not capitalize on the basis or for fresh consumption.

The material basis existence, the available of workforce and the demand for vegetables preserved from SCDL IERNUT area were decisive factors in vegetable processing activity. For this, was studied the technological development specific for some recipes, for example: „preserving cucumbers in vinegar”.

MATERIAL AND METHODS

The experimentation was conducted on three varieties of cucumbers: Ierprem, Levina and Mathilde. We used the method of preservation in a solution made from vinegar, salt and spices (pepper corns, mustard seeds, bay leaves, onion slices) packed in hermetically sealed and pasteurized following the recipe:

$$\text{Jars (820ml)} = \frac{20\text{min}-20\text{min}-20\text{min}}{100^{\circ}\text{C}} \times 0,6 \text{ atm.}$$

The experimentation was made on a sample of 100 pieces of 820-ml jars which has the role of witness and which have been immediately stored after pasteurization in lightless, airy and crisp warehouses, unfreezable, to a maximum temperature of 20 ° C and a relative humidity of maximum 75% and were analyzed after a period of five months. In the conservative technology has been used the sterilization method having the purpose to

eliminate the microorganisms which produce the spoilage. The “thermoabioza” is the method of the heat treatment used in the process of boiling vegetables mixtures in tightly fitting lid’s jars.

The variations regarding the experimental recipes have been determined by testing different percentage rates of the components used in such a way as to please the consumer taste (IF Radu, 1971) from several ways: chemical composition (vitamins, minerals, proteins, sugars, etc.) , organoleptic (taste), olfactory (color), biological (without additives that are unhealthy) etc..

The general manufacturing process of sterilized canned vegetables include the following phases: reception of raw materials, packaging materials, auxiliary materials, sorting vegetables, washing and cleaning of vegetables, vegetable division of the mixture components, heat treatment (tempering vegetables), seasoning the brine (coating liquid), washing the jars, filling and closing them, sterilization of the jars and the storage of the product (Fig. 1).

The laboratory investigations have followed every stage of the technological process by establishing:

- Optimal parameters of the technological process: temperature, time, pressure, concentration;
- The changes of color, flavor, consistency, texture;
- Losses that occur during the process;
- Quality indicators and their methods of control;
- Specific hygiene measures.

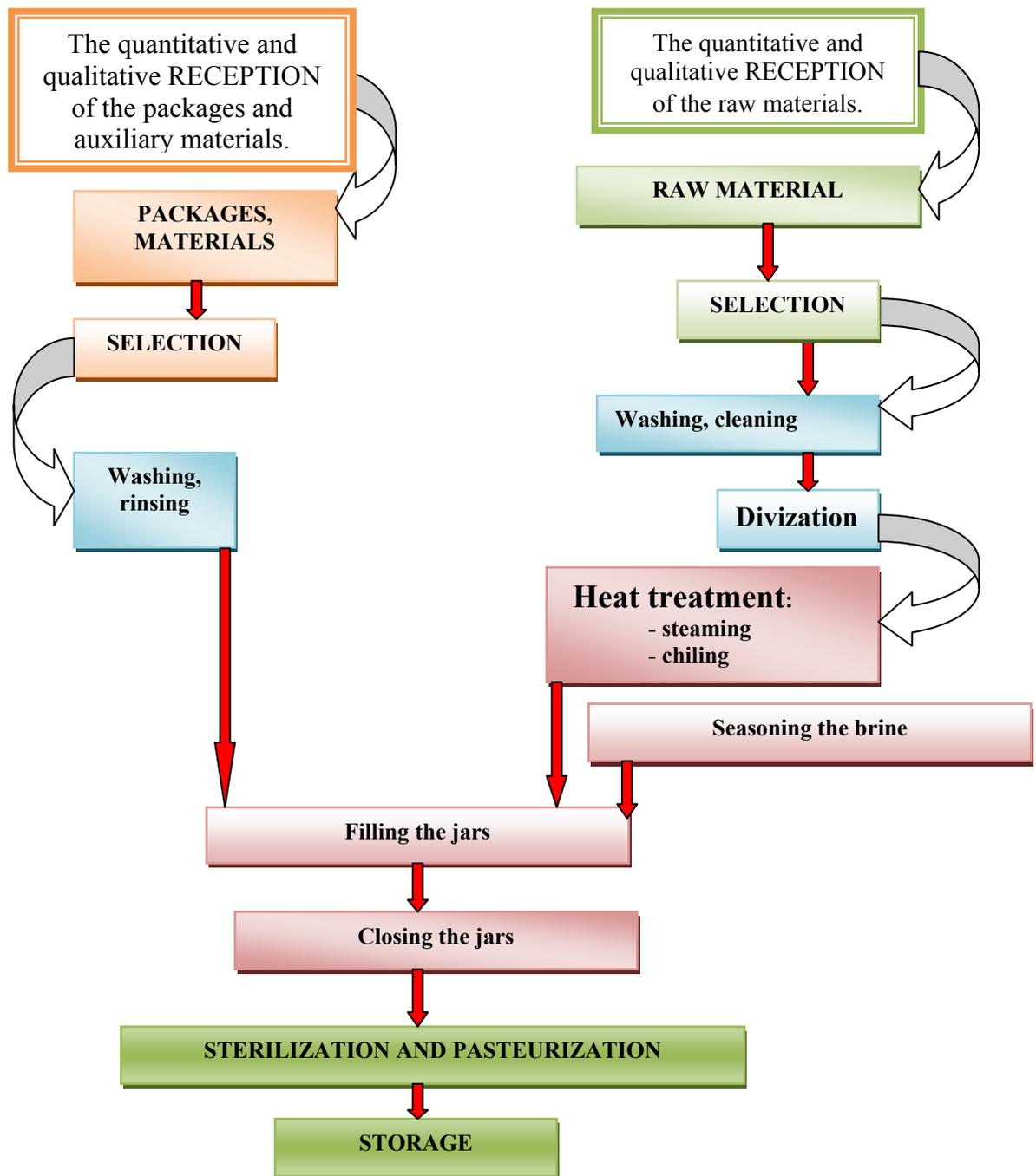


Fig. 1. – The technological flow of the vegetables conservation

RESULTS AND DISCUSSION

The main purpose of the experimental variants' study was to establish the optimal technology regarding the production of preservation cucumbers' recipes in vinegar solution (Table 1) that are demanded by consumers, to be more economical and to have an extended shelf life (from production to consumption). The determination of the optimal technologies will be decided by:

- The quality of used product (different varieties of cucumbers);
- The concentration in sodium chloride of the brine (Na₂Cl)
- Total acidity expressed as acetic acid liquid percentages;
- Heat treatment;
- The analysis of the finished product - organoleptic analysis (appearance, size, color, texture, taste and smell, the appearance and the color of the fluid, foreign bodies, etc.).
- The determination of the air-tightness' cans (closed tight with gibbous head)
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Table 1

The quality study of the preserved cucumbers in vinegar solution at the same concentration of the solution, in 2007, on varieties

| SPECIES | QUANTITY (kg) | | |
|---------------|---------------|------------|------------|
| | Ierprem | Levina | Mathilde |
| Bay leaves | 1 buc. | 1 buc. | 1 buc. |
| Pepper corns | 3-6 buc. | 3-6 buc. | 3-6 buc. |
| Grain mustard | 10-15 buc. | 10-15 buc. | 10-15 buc. |
| Sliced carrot | 2-3 buc. | 2-3 buc. | 2-3 buc. |
| Sliced onion | 2-3 buc. | 2-3 buc. | 2-3 buc. |
| Vinegar | 0,400 | 0,400 | 0,400 |
| Salt | 0,008 | 0,008 | 0,008 |

In the above table was taken in the study the processing of three different types of cucumbers and was monitored the quality of the produce. After pasteurization, using the organoleptic analysis was found that Levine variety through pasteurization is an empty fruit which doesn't keep their green light color, which has spots and has a soft texture.

Table 2

Organoleptic properties and dimensions

| FEATURES | VARIETY | | |
|-----------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| | IERPREM | LEVINA | MATHILDE |
| Aspect | Pickled cucumbers, gherkins kind, healthy, unwrinkled stalks or flowers with the same degree of maturity, without gap | pickled cucumbers, gherkins kind, healthy, unwrinkled stalks or flowers with the same degree of maturity, with gaps | Pickled cucumbers, gherkins kind, healthy, unwrinkled stalks or flowers with the same degree of maturity, without gap |
| Dimension | 6-9 cm | 6-9 cm | 6-9 cm |
| Cucumber color | Dark green to light green, without spots | Very pale green striped with yellow (stained) | Dark green to light green, without spots |
| Consistence | Firm, elastic, with crunchy kernels, without seeds | With mild kernel | Elastic with crunchy kernel, with froming seeds |
| Taste and smell | Pleasant sour-sweet, not bitter | Pleasant sour-sweet, not bitter | Pleasant sour-sweet, not bitter |

The analysis of the organoleptic features during several types of work on the concentration of vinegar solution (acetic acid) was carried out as follows (Table 3)

Table 3

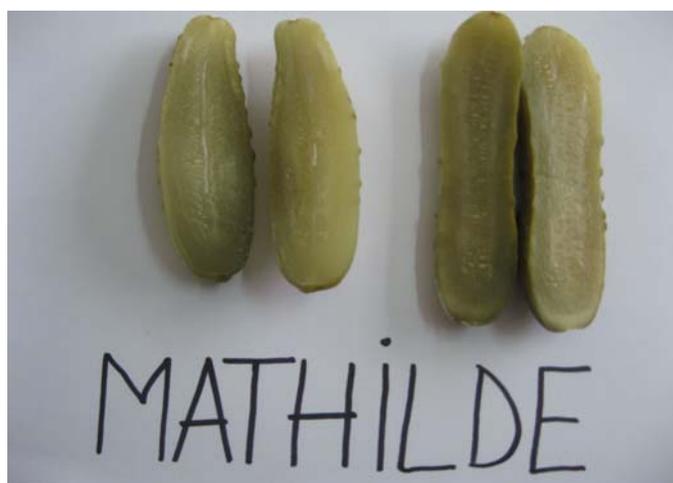
Acetic acid concentration used in those three varieties of canned cucumber

| FEATURES | V ₁ | V ₂ | V ₃ |
|----------------------------------------------|----------------|----------------|----------------|
| Cucumbers content, compared to net weight, % | 60 | 60 | 60 |
| Acetic acid concentration % | 25 | 22 | 20 |
| Sodium chloride % | 2 | 2 | 2 |

For each variant were deposited 100 jars with cucumber pieces over a period of five months. Analyzing the obtained product variant V1 has cucumbers with strong consistency, crunchy kernels, elastic, with a pleasant sour-sweet taste, the solution concentration being of 1.2% acetic acid.

When changing the concentration of vinegar solution, to the variant V3 was obtained a product with acidity of 0.8% acetic acid and after the trial period - about 5 months- have seen a soaking of the cucumbers with too sweet taste.





CONCLUSIONS

The Ierprem cucumber variety is best suited to the vinegar solution. The cans with Ierprem variety is characterized by organoleptic superior traits (smell and taste), and through a long period of storage (from production to consumption). The Levin and Mathilde cucumbers varieties are suited for preserving in vinegar, but only on a period of storage of 2-3 months.

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