

STUDIES ON THE QUALITY OF THE VEGETABLE CANS FROM THE TRADE NETWORK OF THE MUNICIPALITY OF IASI

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The object of this paper was the quality of some assortments of vegetable cans, found in the commercial network of the Iasi City or imported from other countries, for comparison. Most of the products were found within the sensory qualitative parameters required by standards. However, some cans had defects: slightly opaque covering liquid (five assortments) or even thick (in Pickles). Some vegetables have shown a beginning of breaking or strange bodies. Vitae d'oro peas in water had not properly calibrated seeds. On the surface of the vegetable zakuska, we found black mould spots. In vinegar-canned vegetables, the titrable acidity varied between 0.86 and 0.26 g acetic acid /100 g product. In the products made of water thermo-sterilized vegetables, the content of sodium chloride varied between 1.05 and 0.7%. The vegetable concentrates have shown high values of the soluble DM (24-28⁰Bx).

Key words: vegetables, processed products, commercial quality.

The vegetable cans represent about 60% of the total production of horticultural cans, ratio that has gradually become prevalent, because until the sixties of the last century, the fruit cans were prevalent. This tendency was also due to the lower production and selling price, to important exportation opportunities and, at the initial stage, to the necessity of war debts payment. The vegetable cans have gradually become a food consumed at greater extent in towns and the amounts have increased at about 300 thousand t in 1980 (273 thousand t in 1983 – 370 thousand t in 1988). After 1989, the production diminished, less suddenly than in case of fruit cans. A major diminution appeared in the first years of our century (2001 – 2004), but with signs of gradual recovery (2003, 2005 – 2006).

The consumption of vegetables and vegetable products has known a permanent increase, becoming more than double today than in 1990. Importation has also contributed to this phenomenon, but we must emphasize the importance of the internal market demand for this assortment. Romania is not only an important market, but also a perspective future producer of these types of cans.

Table 1

**Data on the processing volume of fruit products
(Statistical indicators) 1950/1989**

Fruit cans (thousand t)	`50	`60	`70	`80	`83	`85	`86	`87	`88	`89
	7	34	172	345	273	316	346	361	370	343

Table 2

Production of fruit cans during 1990-2006 (according to CNS and MAA)

Fruit cans (thousand t)	`94	`96	`98	2000	`01	`02	`03	`04	`05	`06
	122	110	75	61	30	32	40	31	44	42

The vegetable conservation has diminished its volume by three times, because of richer raw material and utilities. This sector knows an unequal modernization, but real concerns on quality improvement were noticed. However, it is affected by the unsafe sources of supplying vegetables and fruits for industrialization and by the lack of retechnologization. On the other side, the consumption is more than double, requiring higher importation.

Table 3

Mean annual consumption of fruits and fruit products per inhabitant 1991-2006)

Fruits and fruit products (kg)	`91	`95	`97	`2000	`01	`02	`03	`04	`05	`06
	88.5	15.6	11.6	34.3	47.2	47.7	77.7	183.3	162.6	181.7

MATERIALS AND METHODS

The investigation was conducted during 2006-2008 and focused on the analysis of the assortments found in the commercial network of the Iasi City, from different categories of vegetable cans. Comparatively, we have also analysed a few assortments of vegetable cans, purchased in some supermarkets from England, Italy and Turkey. Samples were taken individually and not sampled numerically, according to the standard stipulations.

Table 4

Studied assortments of vegetable cans

No.	Assortment	Product	Producing Firms	Auxiliary materials, according to recipe
1	Artificially acidified vegetables	Vinegar cucumbers Vinegar cauliflower Peeled capia peppers Pickles Vinegar cayenne Bell pepper quarters in vinegar Salad of green tomato round pieces Cabbage-filled peppers Assorted pickles in vinegar Vinegar bell peppers Premium cornichons	Râureni, Oltchim SA Râmnicu Vâlcea S.C. Monte Verde Group S.R.L., Caracal Hațegana-Prod S.R.L. Hațeg Maxim's: S.C. Legume Fructe S.A. Buzău Leader internațional S.C. Mersel Company S.R.L. SC. Astral Impex SRL SC Fortuna S.A. Zalău, Sălaj S.C. Leader Internațional S.A., Olt Freshton (England)	Vinegar, salt, sugar, spices: laurel leaves, pepper, mustard grains, water
2	Thermo-sterilized vegetables in water	Lutece green asparagus Carrots in water Pod beans Macedonian vegetable mixture Red beans Pickled peas Cannellini beans	Overseas Group S.R.L. Bucharest S.C. Leader Internațional S.A Caracal Olt Conserv Fruct SRL Bălănești Neamț Bonduelle S.A. Poland Bonduelle S.A. Poland Vitae d'oro, produced for Kaufland Romania Ortomio (Italy)	Water, salt
3	Tomato-based products	Chopped cayenne Tomato paste Bullion Polpa di Pomodoro "Valfrutta" tomato juice	S.C Beta Lucullus S.R.L. Baia Mare S.C.L.F. Răducăneni S.A. Iași S.C. Mersel Companz S.R.L. Ilfov County Râureni Oltchim S.A. Rm Vâlcea Soc. Cop. Agricola, Italy	Salt, thickening agent, acidity corrector, conserver
4	Ready-made vegetables	Vegetable zakuska Jardiniera-Philicon salad Red beans in tomato sauce "Plasmon" food for children Sweet peppers in oil	S.C.L.F: Răducăneni S.A. Iași " Plovdivska Konserva" S.A. Barbunya Pilaki YURT (Turkey) Plasmon dietetici alimentarsi (Italy) Baresa (England)	Salt, vinegar, citric acid, spices, maize starch, rice flour, natural flavours

The sensory analysis has investigated:

- pect of the product and of the covering liquid
- Colour of the product and of the covering liquid
- Taste and smell of the product and of the covering liquid
- Consistence of the product

Physical-chemical determinations:

- Determination of the content in ascorbic acid (According to STAS 5950-85);
- Determination of the acidity (According to STAS 5962-79);
- Determination of the content in acetic acid;
- Determination of the soluble DM (According to STAS 5956-71);
- Determination of the total DM;
- Determination of the salt content (According to STAS 5953-85).

RESULTS AND DISCUSSION

As a result of the sensory analysis, we found out the followings:

Most of the analysed products were found within the qualitative parameters required by the specific standards

Some products had impurities

In some products, the covering liquid was slightly opaque, of unspecific colour.

In **artificially acidified vegetables**, the value of the titrable acidity, expressed in the prevalent acid (acetic) was the maximum at the product *Vinegar bell pepper quarters*, with a value of 0.86g/100g product and the minimum at the product *Assorted pickles in vinegar*, with a value of 0.26 g /100g product.

The most salted product was “*Fortuna*” *assorted pickles*, with a value of the NaCl content of 5.5%, and the less salted one was the product *Vinegar cauliflower*, with a value of 0.60%. The soluble DM has varied between 9.3⁰Bx (sweeter taste) at the “*Fortuna*” *assorted pickles* and 2.4⁰Bx at the *Vinegar cauliflower*.

For **the water thermo-sterilized vegetables**, a higher titrable acidity was registered at pod beans cans. The vegetable mixture had the highest values of the total DM and the highest salt content. The pea cans had the highest value of the soluble DM. Ascorbic acid was found in asparagus and pod beans.

In **tomato-canned products**, the highest acidity was found at the bullion from Râureni, and the lowest one, at the tomato juice. The most salted product was Merve tomato paste.

Within **the ready-made vegetables**, at the Jardiniera Salad, we found that after preparation, a certain amount of ascorbic acid was maintained in the product. The “Plasmon food for children” had a high titrable acidity. Sweet peppers in oil had the highest salt concentration, and in the vegetable zakuska, we found the highest value of soluble DM.

CONCLUSIONS

1. As a result of the organoleptic analysis on studied products, we found out that most of them were within the qualitative parameters required by standards. Most of the products had clean and hermetically closed containers (glass jars and metallic boxes). Labels had all the data concerning producer/distributor, product content and quantity, guarantee period, number of the lot and some recommendations concerning the usage.

2. However, some of the cans had defects, which were shown on the technological flow: slightly opaque covering liquid (five assortments) or even thick (in Pickles). Some vegetables presented a beginning of breaking or strange bodies. Vitae d'oro peas in water had not properly calibrated seeds. On the surface of the vegetable zakuska, we found spots of black mould.

3 In vinegar canned vegetables, the titrable acidity has varied between 0.86 and 0.26 g acetic acid /100 g product, the salt content between 5.5 and 0.6 g/100 g product, and the soluble DM between 9.3⁰Bx (sweeter taste) and 2.4⁰Bx. At four of the 12 analysed products, we found a higher content of ascorbic acid (between 12.7 and 57 mg/100 g product).

4. At the products made of water thermo-sterilized vegetables, the content of sodium chloride varied between 1.05 and 0.7%, while ascorbic acid had significant values in green asparagus (5.3 mg/100 g).

5. The vegetable concentrates had high values of the soluble DM (24-28⁰Bx), respectively of the total DM. The cayenne paste was very salted (over 10% NaCl).

6. In tomato caned products, the titrable acidity varied between 3.6g/100g product at the tomato paste of Răducăneni and 0.33 g/100g product at Valfrutta tomato juice.

7. At the ready-made vegetable products, the value of the titrable acidity was the maximum at "Plasmon food for children" (0.65 g acetic acid /100g product) and the minimum at the Baresa sweet pepper in oil. For a better conservation, at the assortment Jardiniera Salad, ascorbic acid was added.

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