

THE TECHNOLOGY OF OBTAINING COOLING DRINKS FROM FOREST'S FRUITS AND WHEY

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Abstract

The paper proposes the obtaining of a new nutraceutical: cooling drinks from forest's fruits with whey addition. When conceiving a new food there are several factors that needs to be considered like: nutritive and physiological basics for the obtained product, the mass population the product is offered to, the starting material (rough material) supply, the market rank of acceptability. It has been opted for the combination of two products groups: dairy- produce and fruits.
Keywords: forest fruits juice, whey, nutraceutical, pasteurization.

Introduction

Functional nourishment requires exclusively the utilization of natural products with a specific regulator action on organism in general, or on different systems and functions in particular. This type of aliments is capable to satisfy different specific needs for a specific segment of consumers: dietetic products, energizing product, hypo caloric products, or those that prevent different disease of consumers. Functional nourishment ingredients provide energy for human body and act like antioxidants. Also interfere in regulation mechanisms of body-weight, in intestinal microbiocenosis, regulation mechanisms of cholesterol metabolism, normalize of nervous system functions, immune system regulator, stimulate internal organs functions, improve brain activity, activate of peripheral sanguineous system, which contributes to the elimination of metabolic products.

Functional nourishment will be designed for health improvement of people with chronic disease such as: cancer, diabetes, hearts disease, circulatory diseases etc. and will enter to the market to complete our daily diet. Whey and forest fruits cooling drinks due to their basic compounds, help human body in all forms of immune weakness,

infectious states, allergy, convalescence, fatigue, asthenia, physical and intellectual strain, anemia, blood disease, digestive turmoil (Lucescu, 1985; Banu, 1992).

Whey was mixed in juice due to its positive effects on human body. Whey contains orotic acid (B13 vitamin), which proved its value on multiple sclerosis treatment. Orotic acid fixes magnesium at cellular level (Banu, 1992).

Whey proteins reduce the level of cholesterol, stimulate development of T type immune cells, destroys bacteria, stops evolving benign and malignant tumor and even remit cancer, favor muscular – mass increasing, weight adjust, preventing in this way gout (Banu, 1992). These products are recommended especially in the diet of sportsmen, children and old people.

For obtaining fruit juices with whey we followed the next steps: whey preparation, fruit juice obtaining, and fruit juice with whey obtaining.

Experimental

Three variants were experimented:

1. 70% whey and 30% fruit juice (raspberry, blackberry, blueberry).
2. 80% whey and 20% fruit juice.
3. 90% whey and 10% fruit juice.

Whey preparation consists of whey pasteurization at 78°C with 15 sec. maintenance for deproteinisation and filtration and cool at 18°C (Banu, 1992);

Fruit juice obtaining consists in:

- ✓ fruits wash, sort and clean (raspberry, blackberry, blueberry);
- ✓ fruits grind to 2.5 – 3.5 mm;
- ✓ enzymatic treatment for pectin hydrolisation at 11°C with bentonite enzyme;
- ✓ cool press (at 10°C) with a pressure of 20 – 25 kgf/ cm²;
- ✓ Juice rinse by heating at 77 – 78°C for 8 – 10 min, followed by fast cooling at room temperature and filtering (Lucescu, 1985, Beceanu, 2003)

Fruit juice with whey obtaining consists in:

- ✓ mixing fruits juice with whey for 5 min for components distribution;
- ✓ correction of juice taste and acidity is made by addition of sugar juice in proportion of 2.5 – 4 % and ascorbic acid in proportion of 1% thus the pH is between 3.2 – 3.7;
- ✓ Juice pasteurization at 85-90 C for 15...20 sec.
- ✓ Cooled juice is bottled in plastic material bottles with leak-proof cork.

During sensorial analysis was find out that in order to obtain an optimum product with nutritive value, well defined as taste but to keep the fruits flavor, the percent of juice to whey in all assortments must be 80% whey and 20% juice. Because the juice is a functional food, we not added flavors or preservatives. In this case, water is not necessary, dilution of ascorbic acid and sugar can be made entirely in the whey.

The recipe for fabrication of cooling juice with a 3.2 – 3.8 pH is:

- 80 l sweet whey
- 20 l fruit juice (raspberry, blackberry and blueberry)
- 0.1 kg ascorbic acid preliminary dissolved in whey
- 2.5 kg sugar for blueberry and raspberry; 4 kg for blackberry

Results and Discussions

The whey resulted during processing is a liquid green-yellow. In whey are found the majority of soluble milk compounds like lactalbumin, lactose, mineral salts, enzymes, vitamins, fat, etc. The whey chemical composition is presented in table 1. For forest fruits juice with whey, nutritive elements is presented in table 2.

Due to metabolisation of 1g carbohydrates are provided 4.1 Kcal, from 1g lipids are provided 9.3 Kcal and from 1 g proteins are provided 4.1 Kcal (Segal, 1983). Energetically value of those cooling drinks is presented in table 3. Due to vitamins and minerals content, this juice can be considered fortifying product. As well, by its active basic compounds this juice prevents human body of free-radicals action, ensuring detoxification.

Table 1. Used whey chemical composition

| % | Analyses methods | Sweet whey |
|------------------------|----------------------------------|------------|
| <i>Water</i> | STAS 6344/88 | 93.70 |
| <i>Dry substance</i> | STAS 6344/88 | 6.35 |
| <i>Fat</i> | Gerber method, STAS 6352/1-88 | 0.5 |
| <i>Protein</i> | Kjeldahl method, STAS 6355/89 | 0.9 |
| <i>Lactose</i> | STAS 10902/77 | 4.85 |
| <i>Salt substances</i> | STAS 6354/84 | 0.65 |
| <i>Ashes</i> | STAS 6357/75 | 0.5 |

Table 2. Nutritive elements from juices

| Juice type | Proteins, STAS 6355/89 | Lipids, STAS 6352/88 | Carbohydrates STAS 6356/76 |
|----------------------------|---------------------------|-------------------------|-------------------------------|
| | % | | |
| Blueberry juice with whey | 0.88 | 0.05 | 19.85 |
| Raspberry juice with whey | 0.82 | 0.05 | 17.15 |
| Blackberry juice with whey | 0.8 | 0.05 | 13.55 |

Table 3. Energy value of fruit juices with whey

| Juice | Energy value (kcal/100 ml) provided by | | | Total energy value (kcal/100 ml) |
|-------------------------------|---|---------------|--------|--|
| | Proteins | Carbohydrates | Lipids | |
| Blueberry juice with whey | 3.608 | 81.385 | 0.465 | 85.458 |
| Raspberry juice with whey | 3.620 | 70.350 | 0.465 | 74.435 |
| Blackberry juice with whey | 3.280 | 55.550 | 0.465 | 59.3 |

Conclusions

Where obtained three types of cooled drinks considered being functional foods. Through sensorial analysis was found out that

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optimum ratio juice: whey is 1:4. Energetic value of products is higher. The biggest is to blueberry juice, than to raspberry juice and blackberry juice.

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