



Quality manual

For new product development

Project “GoodFruit”

"Increasing competitiveness of Estonian and Latvian food industry based on new and improved local fruit and berry product development"



Linking Estonia and Latvia

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European Union

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Introduction

Estonian and Latvian fruit and berry industries are facing similar problems today. According to various studies, locally grown fruit and berries and the related food products are very attractive to Estonian and Latvian consumers, as they are associated with higher healthiness and lower price than imported fruit. However, currently imported products strongly dominate the markets of both countries. Statistical data indicates that fruit and berry consumption in Latvia and Estonia remains considerably below EU average.

Local fruit growers and food manufacturers fail to meet the market demand largely due to market failures associated with obsolete technologies of storage and processing, resulting in shorter storage period and lower competitiveness of products. The current project introduces novel storage methodologies as well as providing upgraded infrastructure and know-how for product development for both Estonian and Latvian companies, especially SMEs.

The project establish a strong cross-border network of Estonian and Latvian leading sectorial research centers (Pure (LV), Polli (EE)) and industrial partners (Silvanols (LV), Piladzi (LV) and Berry Farming (EE)) as well as public institutions/NGOs focusing on rural development from both countries. By involving additional actors beyond the project partnership, a strong postharvest value chain was created with strong linkages to industrial, academic and public sector partners.



Product development steps

<p>STEP 1- Idea forming</p>	<p>Market research</p> <p>Prior to the production huge importance should be devoted to market research and analysis in order to evaluate the future potential of the new product. Market research should be done by investigating following criteria:</p> <ol style="list-style-type: none"> a) Market segment size b) Market tendencies in past two years c) Major competitors and compositions of competitors products d) Pricing e) Segmentation within market segment
<p>STEP 2 – Product development stages</p>	<p>New product development consists of several stages:</p> <p>S1: Research and analysis of the scientific literature of active ingredients which are intended to incorporate the new product’s formula. S2: Under the supervision of a pharmacist, new product formulation is developed. S3: Development of experimental series of new product S4: Testing of experimental series which includes stability tests, microbiological testing and other tests if appropriate. S5: Development of manufacturing technology S6: Product reformulation or formula and technology approval for pilot batch S7: Stability tests for pilot batch S8: Registration procedure S9: Development of new product packaging design S10: Development of marketing and sales strategy (Including product launch strategy) S11: New product launch</p> <p>NB! Registration procedures and the length of the registration process differ depending in product registration class (Medical devices, OTC etc.)</p>
<p>Required personnel and their responsibilities</p>	<p>Expertise and qualified personnel necessary for new product development are as follows:</p> <ol style="list-style-type: none"> a) Pharmacist – responsible for new product formula development b) Laboratory – responsible for testing and development of experimental series c) Production technologist – responsible for new product development on laboratory scale, development of production technologies and manufacturing pilot batch on industrial scale d) Production manager – responsible for technology implementation in production process e) Qualified production operators – responsible for production f) Marketing and PR specialists – responsible for marketing and advertising campaign development

- g) Designer – responsible for packaging design and advertisement creation
- h) Sales manager – responsible for sales strategy development and product launch
- i) Medical representatives – responsible for sales strategy implementation

Production phase

Production phase – the most important phase of new product development!

In order to be competitive manufacturer should be able to deliver high quality product to end user, therefore the production stage should be perfectly planned, organized and controlled. It is essential to ensure that if there will occur any errors in some of the production stages, the following error will be immediately removed and will not affect other production stages.

The manufacturing plant should be certified according to GMP (Good Manufacturing Practice) or ISO standards. Operating according to these standards ensures full traceability and high quality of the products as well as the product safety.

Marketing strategy

So far, there is no company which created a marketing strategy which would apply to all companies, all products, in all countries and in all cases. Marketing strategy should be developed for each product and for each country individually.

Silvanols, Ltd strongly recommends to spend enough time for market research and to become experts in market segment in which new product will be launched.

Using the appropriate marketing strategy companies can develop their competitive advantage and increase their efficiency or vice versa competitive advantage can be easily lost if the strategy archetype will not be chosen appropriately.

Quality assessment – major results

STABILITY TESTS

Major objective:

1. Examine the composition of newly developed balsams with the base of natural berry juice and test the physic-chemical indices in the storage process by checking the following indicators:
 - A. Total sugar content
 - B. Content of vitamin C
 - C. Content of anthocyanin
 - D. Content of total organic acid
 - E. pH
 - F. Microbiological contamination

Conclusions:

Stability of balsam with a base of combination of black currant and red currant juices is limited, because this combination significantly increases the quantity of juice and because of the fact that both juices are rich with pectin, the pectin are starting to drop out and balsams become cloudy. The compositions of balsams should be developed with a base of each juice separately and should not be combined.

The optimal storage temperature is 18°C. Storage temperature increase significantly affects the stability of the balsam. The following changes can be observed: reduces the amount of vitamin C, changes amount of anthocyanin and content of organic acid.

Balsam with a base of in Latvia grown red currant's ("Viksnes red") juice after the 90 days observation period keeps stable and there are no changes observed in amount of vitamin C, amount of anthocyanin and content of organic acid.

Balsam with a base of in Latvia grown black currant's ("Titania") juice after the 90 days observation period keeps stable and there are no changes observed in amount of vitamin C, amount of anthocyanin and content of organic acid.

The major data stability tests are summarized in Table 1 and Table 2

Table 1 – Stability results of Kidisil

No.	Number of observation days	Total amount of organic acids mg/ml	pH	Total amount of vitamin C mg/100ml	Total amount of anthocyanin mg/ml	Microbiological testing
1	0	14,2	3,5	51,8	0,04	<1kkv/ml
2	30	14,0	3,5	51,8	0,032	<1kkv/ml
3	60	14,2	3,4	51,0	0,030	<1kkv/ml
4	90	14,0	3,5	50,9	0,028	<1kkv/ml

Table 1 – Stability results of Ferosil

No.	Number of observation days	Total amount of organic acids mg/ml	pH	Total amount of vitamin C mg/100ml	Total amount of anthocyanin mg/ml	Microbiological testing
1	0	10,9	2,8	26,1	0,02	<1kkv/ml
2	30	10,9	2,8	26,1	0,02	<1kkv/ml
3.	60	10,7	2,7	24,8	0,015	<1kkv/ml
4.	90	10,7	2,9	24,8	0,012	<1kkv/ml

STANDARDIZATION METHODOLOGY

Major objectives:

1. Determine the cranberry, red currant and black currant drying parameters that provide optimum content of active substances in the resulting product.
2. Determine the optimum parameters of dried berries, which ensure effective product crushing technology.
3. Develop specifications for dried cranberry, red currant and black currant powders.

RESULTS:

Drying technology parameters:

1. Humidity of drying material 7-10 %
2. Optimal drying temperature 70°C
3. Optimal drying length 5-7 hours (depending on the humidity %)

Developed specifications of powders

Beries	Humidity %	Content of Anthocyanins mg/100g	Amount of vitamin C mg/100g
Cranberry	7-10	145-155	55-65
Black currant	7-10	470-480	110-115
Red currant	7-10	95-100	30-40

NEW PRODUCTS DEVELOPED

Ferrosil



Balsam complex of natural iron, vitamins and trace elements that is required for formation of hemoglobin and a better use of it in body.

Balsam contains ferrous gluconate form which absorbs in the body most quickly and efficiently.

Base of the balsam: Red currant juice



Natural products from Silvanoli

Kidisil



Syrup for children to ensure an additional source of vitamins. The ingredients are a perfectly balanced complex of vitamins and mineral substances, which prevent a lack of vitamins, stimulate recovery and improve physical and mental development.

Base of the balsam: Black currant syrup.



Natural products from Silvanoli

Urisil



Cranberry + red currant + black currant juice dry extract complex fight urinary tract infections and strengthen cardiovascular and immune system. Extracts are rich source of microelements.



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