

# Cross-visit 'Organic farming supply and value chain optimisation'

Tuscany, Italy  
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“Production and processing of organic and conventional cabbage, investigating and developing innovative zero-residue technologies for obtaining sauerkraut juice powder and using it in the creation of new products with high added value”

*Zanda Kruma, Liene Jansone, Latvia*



# “DEHYDRATED AND CONCENTRATED SAUERKRAUT JUICE IN FOOD APPLICATIONS AND COSMETICS”

**Liene Jansone and Zanda Krūma**

ESF project Nr. 8.2.2.0/20/I/001/TOPIC ES32 – “Latvia University of Life Sciences and Technologies transition to the new doctoral funding model”

European Innovation Partnership for Agricultural Productivity and Sustainability Working Group Cooperation project 18-00-A01612-000020.





## Latvia University of Life Sciences and Technologies



Latvia University of Life Sciences and Technologies is one of the largest universities in Latvia providing studies and conducting research in various economic sectors in which the university implements education and research competences.

- unique areas – agriculture, forestry, veterinary medicine, food technology and landscape architecture;
- universal areas – information technologies, economics, social sciences and social sciences, rural engineering, civil engineering and pedagogy.



## The relevance of the study

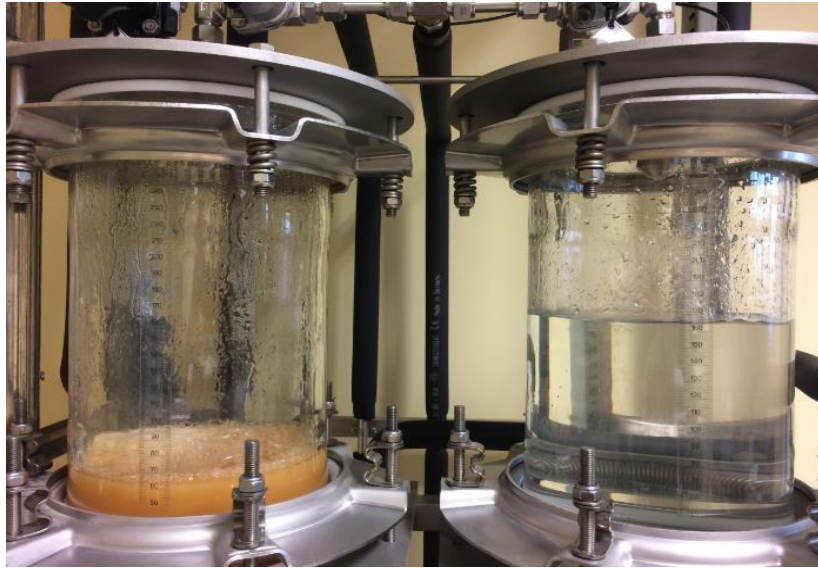
- During the production of sauerkraut cabbage juice is released almost immediately after the addition of salt, and can sum up to 30% till the end of the process of this so called waste water.
- Development of value-added use of sauerkraut juice would contribute to sustainable residue - free technology in processing plants as well as create high value-added products







## Evaporation - Reduced drying time and costs; Result – an innovative product



**Rising film evaporator**



**Rotary vacuum evaporation**



**Falling film evaporation**

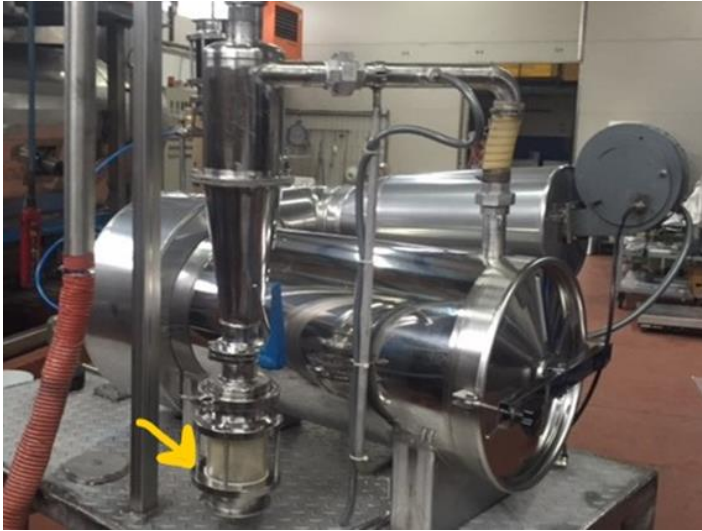
- Concentration from 5% - 35%
- Prolonged shelf-life
- Unique taste attributes



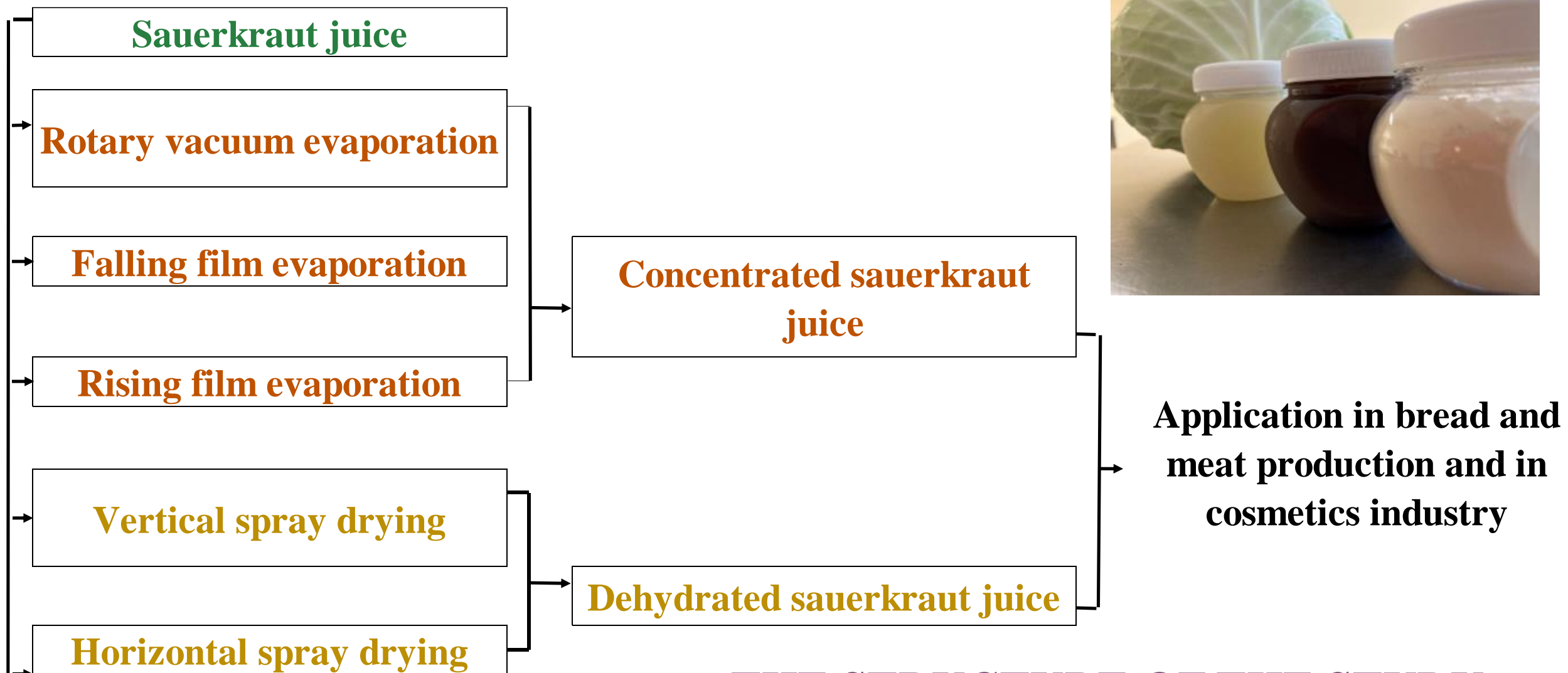


# “DEHYDRATED AND CONCENTRATED SAUERKRAUT JUICE IN FOOD APPLICATIONS AND COSMETICS”

## Horizontal and vertical spray -dry







## THE STRUCTURE OF THE STUDY





## The objective of this study

To test dehydrated and concentrated sauerkraut juice in food applications and in cosmetics.

Production and delivery of raw material

SIA «Dimdiņi Agro»



Evaluation of drying and evaporation technologies

Product quality assesment



Possibilities and tests of the developed products in the production process of bread and meat



Possibilities and tests of the developed products in cosmetics

SIA «Cosmetic Lab»



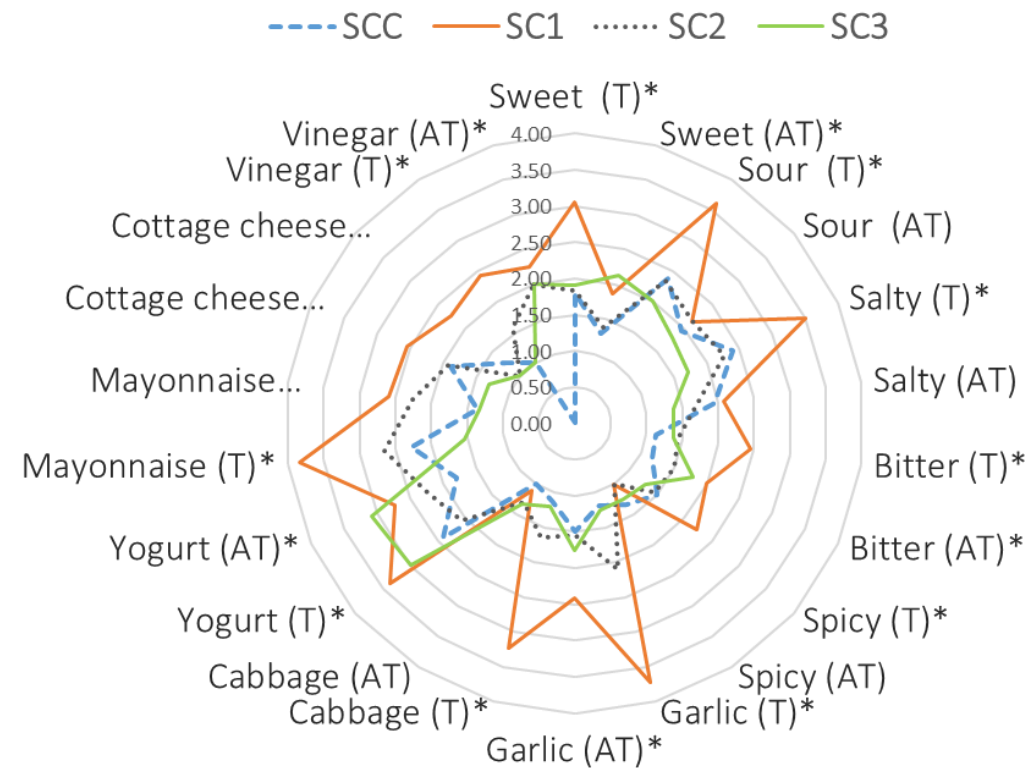


**Tests in food  
applications**





# “DEHYDRATED AND CONCENTRATED SAUERKRAUT JUICE IN FOOD APPLICATIONS AND COSMETICS”



Taste intensity – SC1. Salty, sour, garlic, mayonnaise. Yogurt, also cabbage and cottage cheese

Volatile compound odours – sweet, sour, cheese-like, aromas, buttery, also fishy/amine (SC2, SC3)

Overall liking – SC2





- When fermenting **whole heads of cabbage**, it is recommended to use a concentrate obtained from sauerkraut with a 1% salt content.
- It is recommended to use **dehydrated sauerkraut juice** in the production of **salad dressings**, as there is no disturbing taste and smell of the concentrate.
- It is not recommended to ferment assorted vegetables in cabbage juice concentrate, because the specific aroma and taste suppresses the taste of other vegetables, as well as the visual appearance is not attractive to consumers.





## Thermally unprocessed meat products with concentrated sauerkraut juice



- the taste characteristics can both - improve (onion sausages) or deteriorate (kupats) in sausage-like products,
- a decrease in shelf-life was detected in all of the products,
- improved taste and consistency changes in marinades with mayonnaise or oil addition





## Cured and smoked meat products with concentrated sauerkraut juice



- The addition of sauerkraut juice concentrate to smoked or cured meat products, a negative taste and smell characteristics are observed,
- The shelf-life is significantly reduced,
- Organoleptic parameters are not satisfying.







## Dehydrated and concentrated sauerkraut juice in the production of bread



### Results

- Dehydrated sauerkraut juice:
  - the sourness of the bread was sufficient,
  - the taste and smell of cabbage juice was not noticeable.
- Concentrated sauerkraut juice:
  - the taste and aroma of the concentrate can be felt

### Conclusions

- Sauerkraut juice, dehydrate and concentrate can be used in bread and crisp-bread recipes, but it is important to evaluate their added value.
- The dehydrate can partially replace the amount of added salt and sugar !!!



## Dehydrated and concentrated sauerkraut juice in the cosmetics



### Products tested:

- anti-age face cream
- nail cuticle serum
- body peeling
- nutritional supplements

- The intended pH lowering function was not observed.
- The use in cosmetics is greatly interfered by the specific aroma.
- Spray-drying with maltodextrin as a wall material is more successful in cosmetic products.
- Concentrate has the potential to be used as a nutritional supplement







## Dehydrated and concentrated sauerkraut juice in the cosmetics

«Cosmetic Lab» Ltd

### Products tested with the effect of reducing psoriasis:

- bath balls,
- body scrub,
- bath salt
- dry shampoo, shower gel, soap.



- It is challenging to achieve a good visual effect and smell of the product in cosmetic products with the use of the concentrate.
- Difficult to achieve product stability, because even from the same batch, the products used to differ in color and smell.
- Dehydrated sauerkraut juice in the products had better organoleptic results but the cost of the products is very high.



## **Summary**





- Concentrated sauerkraut juice can be used in catering – for soups, marinades and sauces
- Dehydrated sauerkraut juice can be suitable in salad sauces and in food applications to partially substitute salt and sugar amount.
- A further research in product stability and usage can be fruitful.

Research was carried out by financial support ESF project Nr. 8.2.2.0/20/I/001/TOPIC ES32 – “Latvia University of Life Sciences and Technologies transition to the new doctoral funding model”



# Thank you!





# EU CAP Network cross-visit 'Organic farming supply and value chain optimisation'

28-29 June 2023, Tuscany (Italy)

All information on the cross-visit is available on the event webpage:

[https://eu-cap-network.ec.europa.eu/events/eu-cap-network-cross-visit-organic-farming-supply-and-value-chain-optimisation\\_en](https://eu-cap-network.ec.europa.eu/events/eu-cap-network-cross-visit-organic-farming-supply-and-value-chain-optimisation_en)

