

The potential of by-products from chokeberry processing - development of a sustainable method of upcycling fruit processing waste

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BACKGROUND:

A lot of research work has been devoted to assessing the potential of chokeberries and their juices. Research on the functional by-products of chokeberries processing, as well as their fuller use as secondary raw materials, have a much smaller share in the literature. The project assumes 100% use of a by-product of chokeberry processing. The implementation of the planned scope of work makes it possible to fill the research gap and fits very well into the priority research areas defined by the EU

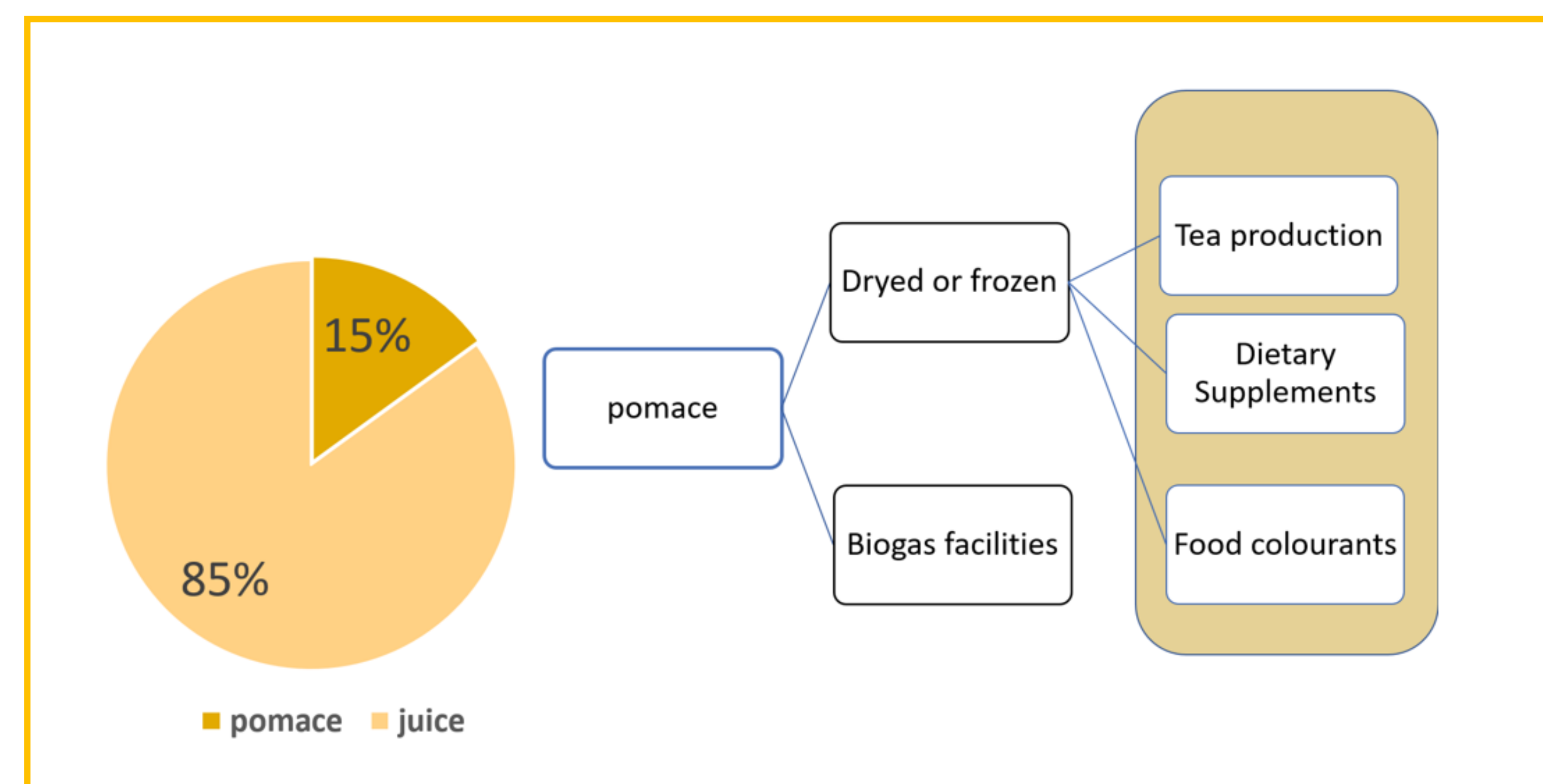
RESEARCH QUESTIONS:

- How to develop an innovative food product by design thinking method using chokeberry by-products according to the circular economy strategy.
- Which group of functional food consumers will be most interested in a product that meets the design assumptions?
- What features and properties must the designed product have to meet the needs and expectations of consumers?
- What are the benefits and concerns of the planned solution for the producers of by-products?

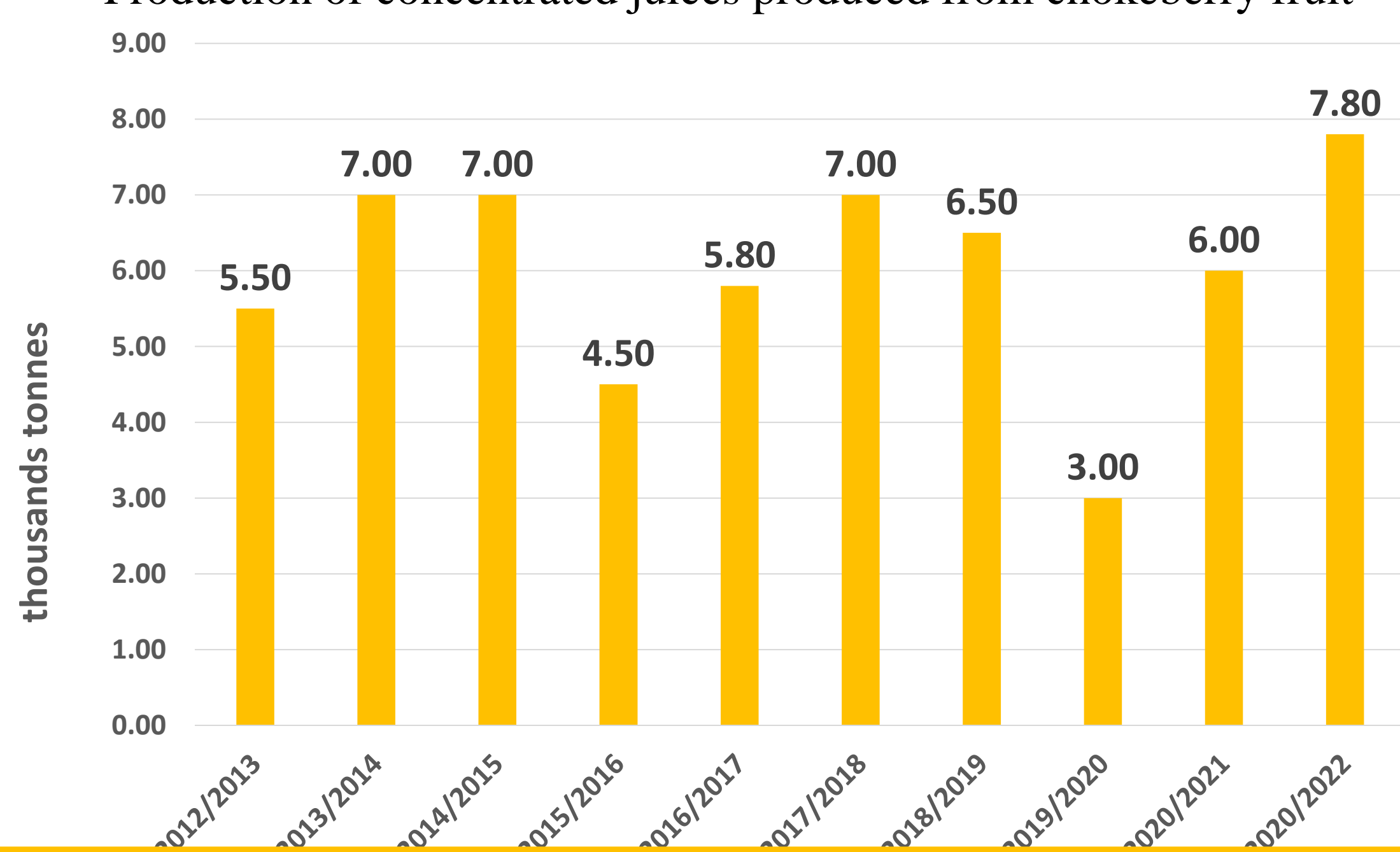
The study aimed to assess of the potential and possibility of using pomace for producing innovative food products and the degree of consumer acceptance of innovative products with functional properties based on chokeberry.

A group of 24 adult consumers was asked to rank 10 products (hypothetical products) that may contain chokeberry by-products as one of the ingredients (the method: Focus Group Interview).

Group 1	Group 2	Group 3
	Consumer of functional food	
	Residents of large cities (500,000 and more)	
	Open to food/communication news	
	Good or very good financial situation	
Athletes	A consumer who cares about his own health (through proper nutrition)	
Up to 35 yo	Up to 35 yo	Above 35 yo



Production of concentrated juices produced from chokeberry fruit



Poland is the undisputed leader in chokeberry production. The chokeberry area is growing year to year. However, the prices paid to producers for fruit did not increase linearly. The average price of chokeberry intended for processing in 2021 amounted to 0.25 euros/kg and was 40% lower than in 2020.

The analysis of Poland's volume of chokeberry juice production was made to estimate the raw material market, which is a part of the product management process.

In Poland, the production of chokeberry juice concentrate **increased from 6.0 to 7.8 thousand tonnes**, generating a correspondingly more significant amount of pomace. It is necessary to know the pomace parameters (water %, acidity, polyphenols content) to prepare them for further processing.



Based on the literature review and market research a few products (hypothetical products) have been designed that may contain chokeberry by-products as one of the ingredients. Then a group of 24 adult consumers of functional food were asked to rank these products.



RESULTS:

- Consumers indicated that **bars, yoghurts and bread** are the most familiar products where chokeberry pomace can be used.
- It can be seen as a direction for further research. Now, the challenge is to develop valuable products of satisfactory quality.
- It is necessary to take specific horizontal measures to minimise waste by reusing and implementing full recovery of by-products, notably by treating them as a potential source of secondary raw materials.

FURTHER RESEARCH

- verification of chokeberry pomace parameters
- the CAWI survey on the acceptance of by-products in food production
- summary of empathization stage and selection of ideas
- ideation, prototyping and testing of new product

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