



Q&A:

Milk VS

Plant based beverages



Why milk and dairy are so important in our diet?



- Milk is a naturally nutrient-rich food.
- Dairy foods are natural sources of high-quality protein, essential vitamins B2, B12 and minerals such as calcium, phosphorus, potassium and iodine.
- Dairy nutrients play an important role in maintaining good health during all stages of life. They especially have an impact on bone health, muscle growth, nutrition and are beneficial for weight management and non-communicable diseases, such as type 2 diabetes.
- The milk matrix provides a naturally nutrient-rich package in comparison to formulated plant-based beverages (PBB).

Do Plant-based beverages (PBB) provide the same nutritional benefits as milk?



- The milk matrix¹ is a naturally nutrient-rich package. For example, calcium in milk is an integral part of the milk matrix and it actively interacts with other milk nutrients to create unique biological interactions inside the body. PBB do not contain natural calcium, it is added artificially.
- PBB are fortified drinks, formulated to imitate the nutritional composition of milk, however **there is no PBB product available that can deliver the full nutritional benefits that milk provides naturally**. PBB cannot be therefore considered as nutritionally equivalent to milk.

EDA Q&A on Milk vs Plant Based Beverages is adapted from the IDF report “Data comparison of milk and plant based beverages” published in 2020

¹ [EDA Factsheet: The Role of Dairy in Helping to Prevent Lifestyle Diseases](#)



- Animal sourced proteins such as milk proteins, are of a 10-30% higher biological quality than plant sourced proteins². This means that dairy protein provides all the essential amino acids that the human body requires and is not able to synthesise itself. Plant proteins, on the other hand, often do not contain the right proportions or sometimes even lack certain essential amino acids needed by humans. The correct combination and often larger amounts of different plant protein sources are thus needed to fulfil daily needs.
- Studies show that milk has many health benefits³. However, there is currently little scientific evidence supporting the health benefits of PBB.

Do PBB guarantee the health benefits of milk?



- Addition of nutrients found in milk to PBB does not guarantee the same health benefits.
- Many PBB contain added sugar to help with taste, whereas milk only contains lactose which is a naturally occurring sugar.
- PBB tend to be lower in protein content and quality of protein (except for soy beverages which are similar in protein content but still not equivalent in protein quality).
- PBB do not have the benefit of the milk matrix, because the nutrients in PBB are isolated and individually added. Milk matrix allows for the complex interaction of all natural components of milk.
- A serving of a highly processed PBB is not nutritionally equivalent to that same serving of the raw plant and does not possess the same health benefits.

Does dairy production negatively affect the environment?



- The dairy sector is continuously working hard to implement best practices, as well as to develop, innovate and research new technologies to reduce its impact, to better care for the environment.
- The green house emission per litre of milk has been reduced globally by 11% between 2005 and 2015⁴
- It is important to consider the ecological footprint as a function of nutrient content rather than total mass produced, for the same nutritional density less dairy is required compared to PBB.
- The dairy sector provides a wide range of benefits such as biodiversity, biomass, rural vitality, traditional landscape, grassland, in comparison to mono-culture plant production as needed for PBB.

² [EDA Factsheet: Dairy- A Source of High-Quality Protein](#)

³ [EDA Factsheet: Health and Nutritional Benefits of Dairy](#)

⁴ International Dairy Federation, 2020. *Data Comparison of Milk and Plant-Based Beverages*. Page 7



- There is a better understanding of the impact of the dairy life cycle, from production to utilization, which is used to find new ways to improve and optimise the production chain to better benefit the environment. For example, there is a higher waste processing in the dairy sector.⁵

Are PBB better for the environment?



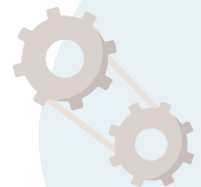
- The environmental impacts of PBB may generally look better per kg of product, but milk could perform better when the impacts are expressed per nutritional value.
- There is a lack of scientific evidence supporting the environmental benefits of various PBB.
- The food system needs a multidimensional approach, as plants and animals work best as an integrated system.
- Very few scientific peer reviewed articles have been published on the negative impacts of PBB production.
- PBB produce large amounts of waste and hard-to-dispose by-products while the dairy sector valorises its waste successfully.
- Most consumers are confused about the interpretation of nutritional value regarding PBB compared to cow's milk.

How does dairy benefit our societies and cultures?



- Economic assessments show the dairy industry and development has an impact on the reduction of poverty worldwide, every year.
- FAO studies show that the collection and distribution of milk generated a considerable amount of direct and indirect employment. There was even more generation of employment when they looked at processing and retail, depending on the product types being created⁶
- There is also a significant benefit to women in developing countries as it helps them with job security and food lifting their families out of poverty.
- Dairy is a vital part of many cultures, with products such as feta, parmesan, manchego and quark, being fundamental to a national identity and pride to share with others, as well as a joint European identity.

Why PBB is much more processed than milk?



- Milk is a natural product with minimal to no processing needed. It can be consumed directly after milking but goes through processing to sanitise and increase hygiene, as well as to increase the shelf life with no additives/preservatives added. (see figure 1).
- In comparison, oat beverages take on average 14 steps, almond beverages take 15 steps and soy beverages 13 steps (see Annex 1 below for the full diagrams).

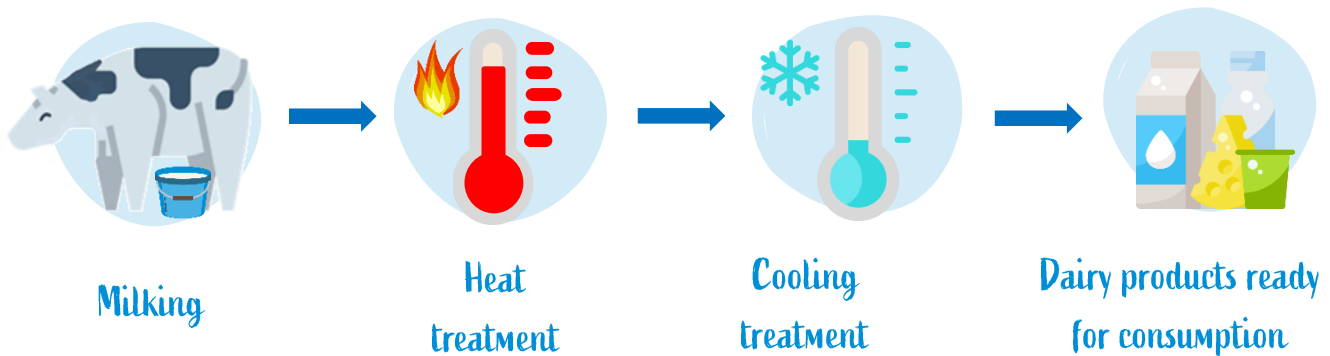
⁵ Ibid

⁶ International Dairy Federation, 2020. *Data Comparison of Milk and Plant-Based Beverages*. Page 15

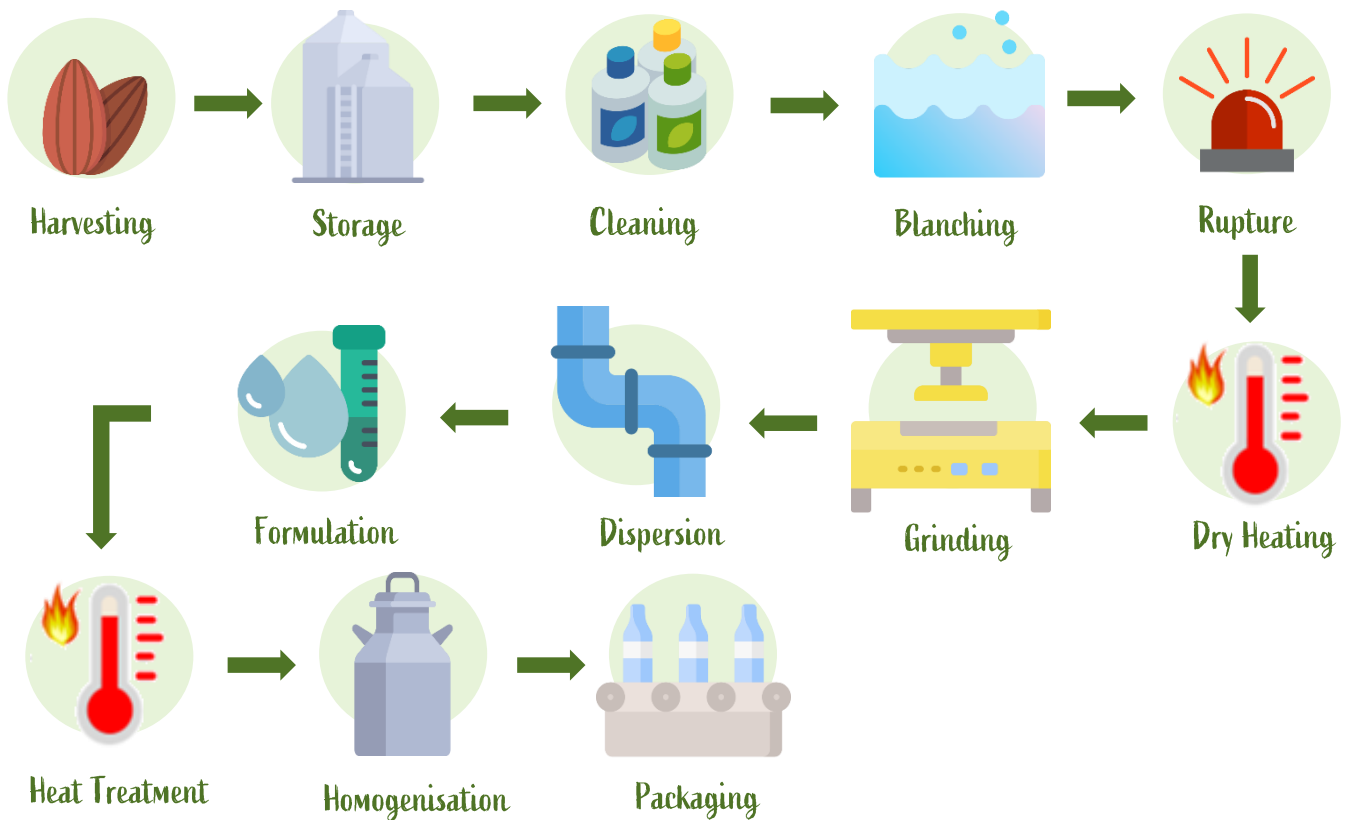


Figure 1: The processing steps for dairy milk and the processing steps for almond beverage⁷

Processing steps for dairy milk



Processing steps for almond beverages





⁷ International Dairy Federation, 2020. *Data Comparison of Milk and Plant-Based Beverages*. Page 16,17



Do PBB contain many additives?

- As PBB are formulated drinks, there is a need for several additives to attempt to mimic the nutritional profile of milk as well as additives for taste and product stability.
- Whilst milk is only one ingredient, PBB is made of several ingredients including additives, with less nutritional benefits (figure. 2)⁸
- Figure 3 is a table comparing the nutrient profiles of milk with various PBB from Alpro^{9,10}

Figure 2: Ingredient list for cow's milk vs almond beverage (Alpro)

 Dairy Milk	Milk
 Almond based beverage	Water, Almond (2.3%), Sugar, Calcium (Tri-Calcium, phosphate), Sea salt, Stabilisers (Locust bean gum, Gellan gum), Emulsifier (Lecithins (Sunflower)), Natural flavouring, Vitamins (B2, B12, E, D2)

- The most common additives found in PBB include (but are not limited to): Tricalcium Phosphate (E 341 (iii)), Dipotassium Phosphate (E340), Potassium Citrate (E332), Vitamine E Acetate, High Oleic Sunflower Oil, Folic Acid, Zinc Oxide, Vitamin B-12, Riboflavin (B2), Vitamin A Palmitate, Ergocalciferol, Salt/ Sea Salt, Calcium Carbonate (E170), D-alpha tocopherol (vitamin E), Magnesium Phosphate (E 343), Acacia Gum (E414), Xantham Gum (E415), Guar Gum (E412), Natural colours, Natural Flavours, Tapioca Starch, Soy Lecithin (E 322), Sunflower Lecithin (E322), Locust Bean Gum (E410)¹¹

Figure 3: Nutrient table of different types of milk and PBBs

Per /100 ML	Dairy Milk (full)	Dairy Milk (skimmed)	Soya Drink	Oat Drink	Almond Drink	Rice Drink	Coconut Drink	Hazelnut Drink	Cashew Drink
Protein	3.2g	3.3g	3.3g	0.3g	0.4g	0.1g	0.1g	0.4g	0.5g
Carbohydrates/ sugars	4.7g (lactose)	4.7g (lactose)	2.7g (2.5g)	7.2g (3.3g)	2.4g (2.4g)	9.5g (3.3g)	2.7g (1.9g)	3.2 g (3.2g)	2.6g (2g)
Fats (saturated)	3.6g (2.1g)	1.6g (0.9g)	1.9g (0.3g)	1.5g (0.1g)	1.1g (0.1g)	1g (0.1g)	0.9g (0.9g)	1.6g (0.2g)	1.1g (0.2g)
Calories	64kcal	46 kcal	42 kcal	46 kcal	22 kcal	47 kcal	20 kcal	29 kcal	23 kcal
Vitamin b2	0.48 mg	0.44g mg	0.21 mg	0.21 mg	0.21 mg	-	-	0.21 mg	0.21 mg
Vitamin b12	1.07 µg	1.30 µg	0.38 µg	0.38 µg	0.38 µg	0.38 µg	0.38 µg	0.38 µg	0.38 µg
Potassium	349 mg	382 mg	-*	-	-	-	-	-	-
Phosphorous	222 mg	247 mg	-	-	-	-	-	-	-
Calcium	276 mg	306 mg	120 mg	120 mg	120 mg	120 mg	120 mg	125 mg	120 mg

*data not provided by Alpro

⁸ Alpro.com. 2021. *Almond Milk Alternative Drink - Original*. [online] Available at: <<https://www.alpro.com/uk/products/drinks/almond-drinks/almond-original/>> [Accessed 26 March 2021].

⁹ Ibid

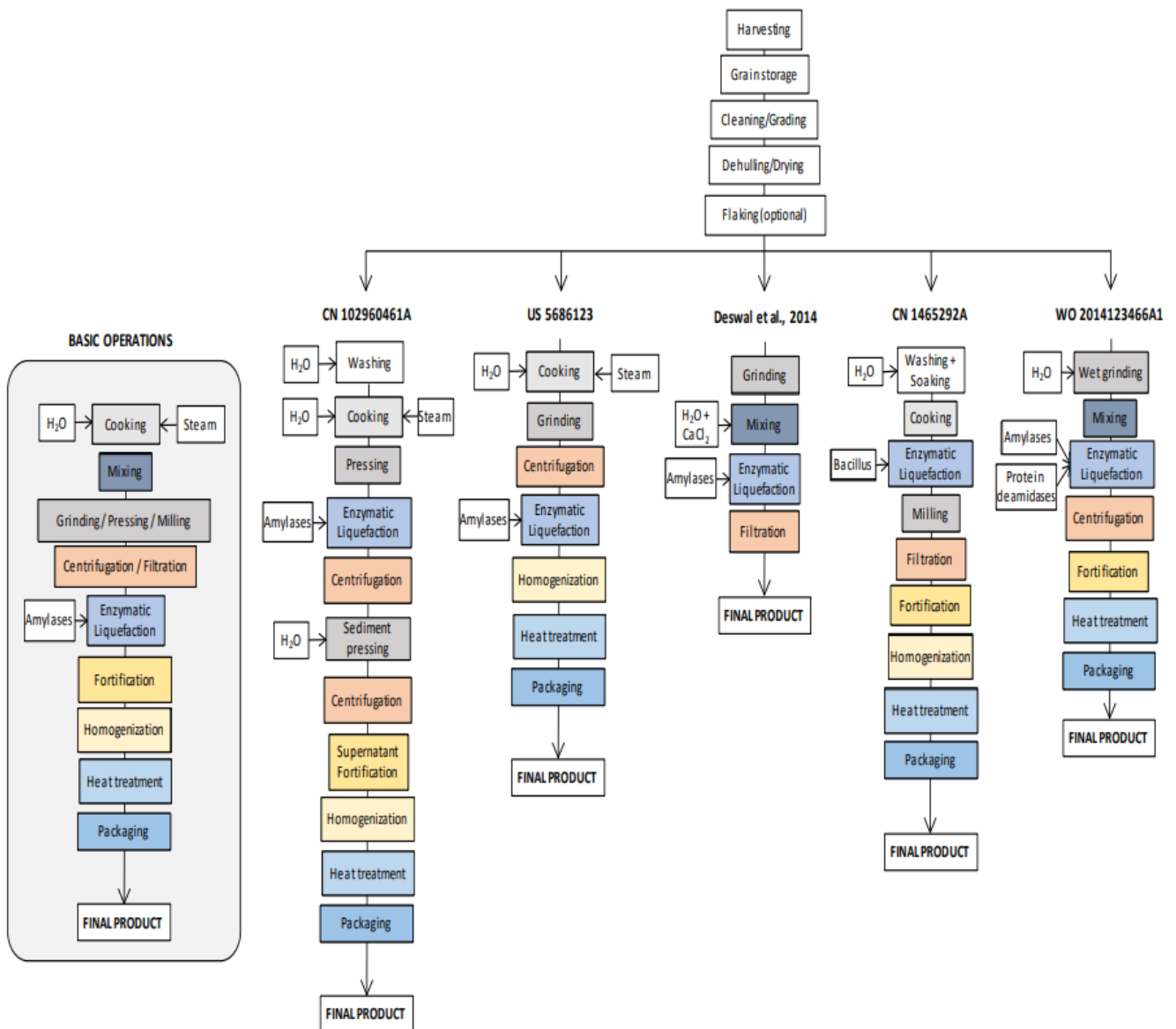
¹⁰ Delhaize.be. 2021. [online] Available at: <<https://www.delhaize.be/fr-be/shop/Cremerie/Lait/Demi-ecreme/Lait-Demi-Ecr-Bio/p/S2018041800051210099>> [Accessed 27 March 2021].

¹¹ International Dairy Federation, 2020. *Data Comparison of Milk and Plant-Based Beverages*. Page 18



Annex 1¹²

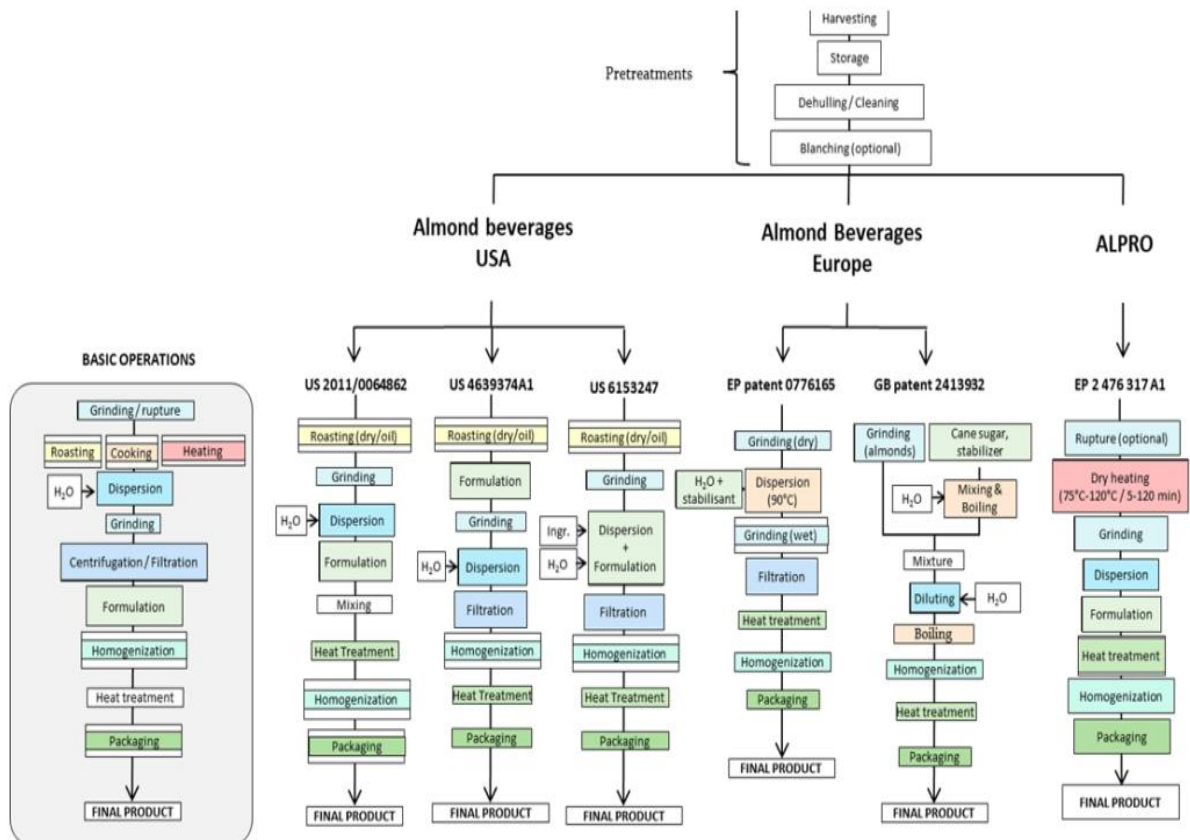
PROCESSING STEPS FOR OAT BEVERAGE



¹² International Dairy Federation, 2020. *Data Comparison of Milk and Plant-Based Beverages*. Page 16,17,18

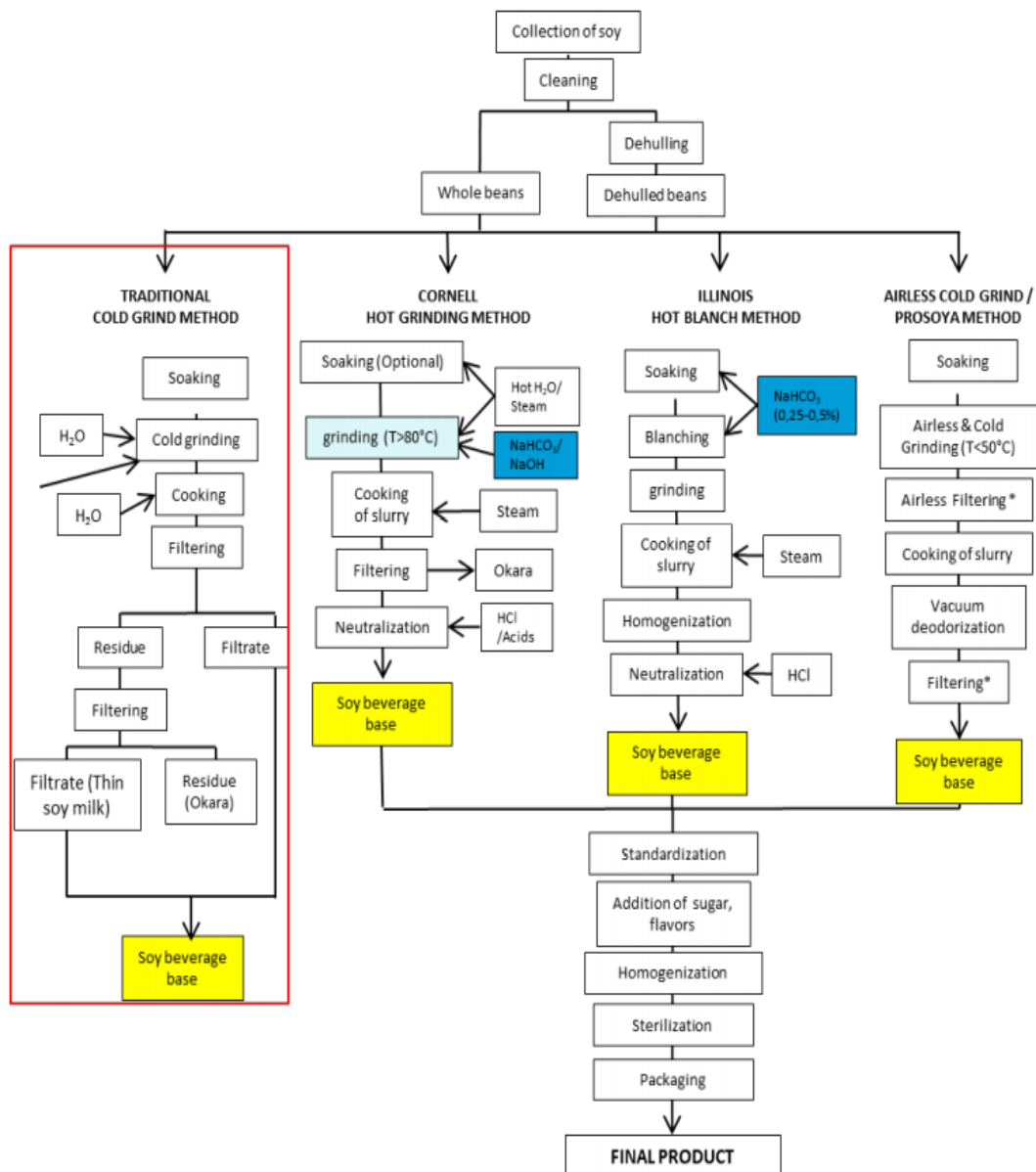


PROCESSING STEPS FOR ALMOND BEVERAGE



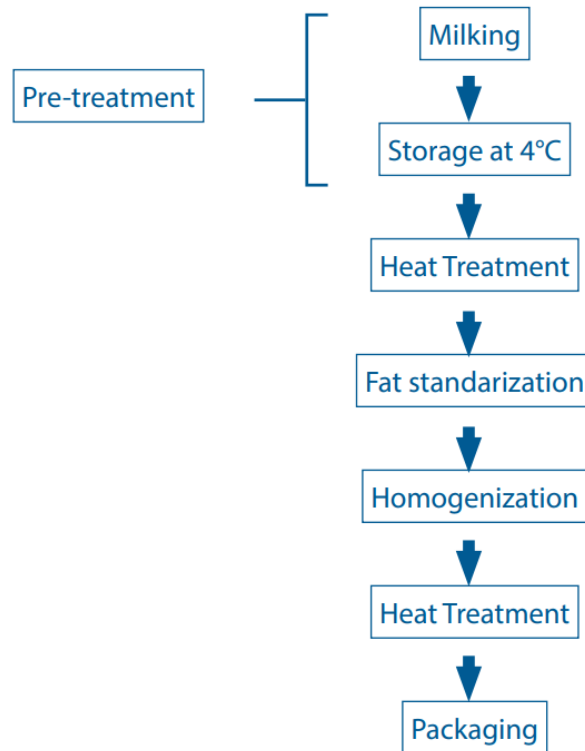


PROCESSING STEPS FOR SOY BEVERAGE





PROCESSING STEP FOR MILK





References and further reading

EDA Q&A on Milk vs Plant Based Beverages is adapted from the IDF report "Data comparison of milk and plant based beverages" published in 2020.

1. [EDA Factsheet: The Role of Dairy in Helping to Prevent Lifestyle Diseases](#)
2. [EDA Factsheet: Dairy- A Source of High-Quality Protein](#)
3. [EDA Factsheet: Health and Nutritional Benefits of Dairy](#)
4. International Dairy Federation, 2020. *Data Comparison of Milk and Plant-Based Beverages*. Page 7
5. Ibid
6. International Dairy Federation, 2020. *Data Comparison of Milk and Plant-Based Beverages*. Page 15
7. International Dairy Federation, 2020. *Data Comparison of Milk and Plant-Based Beverages*. Page 16,17,18
8. Alpro.com. 2021. *Almond Milk Alternative Drink - Original*. [online] Available at: <<https://www.alpro.com/uk/products/drinks/almond-drinks/almond-original/>> [Accessed 26 March 2021].
9. Ibid
10. Delhaize.be. 2021. [online] Available at: <<https://www.delhaize.be/fr-be/shop/Cremerie/Lait/Demi-ecreme/Lait-Demi-Ecr-Bio/p/S2018041800051210099>> [Accessed 27 March 2021].
11. International Dairy Federation, 2020. *Data Comparison of Milk and Plant-Based Beverages*. Page 18
12. International Dairy Federation, 2020. *Data Comparison of Milk and Plant-Based Beverages*. Page 16,17,18