



Dairy
technology3
(Fermented Milks
and By-Products)
(Code FS 0705)

- Practical lesson 5, for Food science program, level 4, 2019-2020

- By:

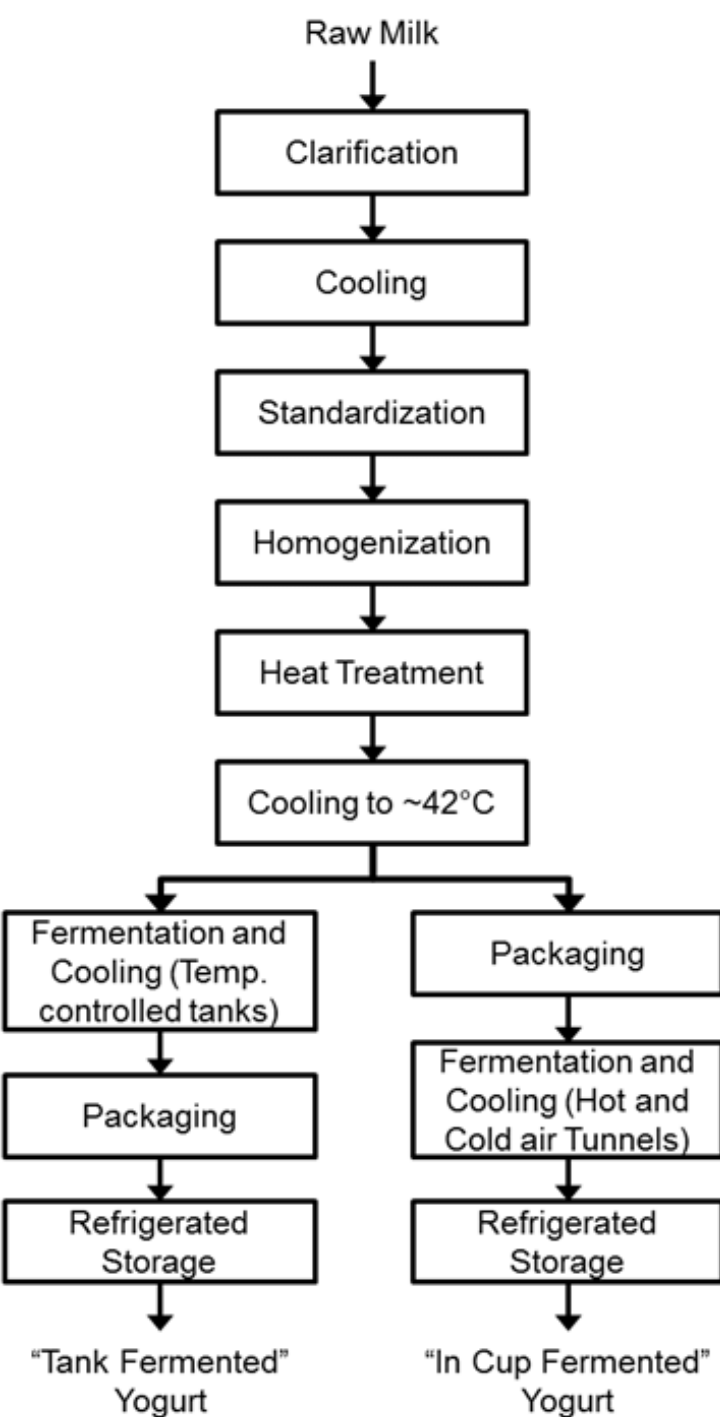
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Manufacture of fermented milks

1- yoghurt:

- Yoghurt is considered one of the most important dairy products all over the world for its desirable properties and nutritive value.
- It may be made from milk of cows or buffalos.
- The following diagram shows the main steps of yoghurt production.



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- Process diagram for yogurt production [1]

Table 4.6 Some common defects of yoghurt that might be noted by a taste panel, and an indication of some possible causes and remedies.

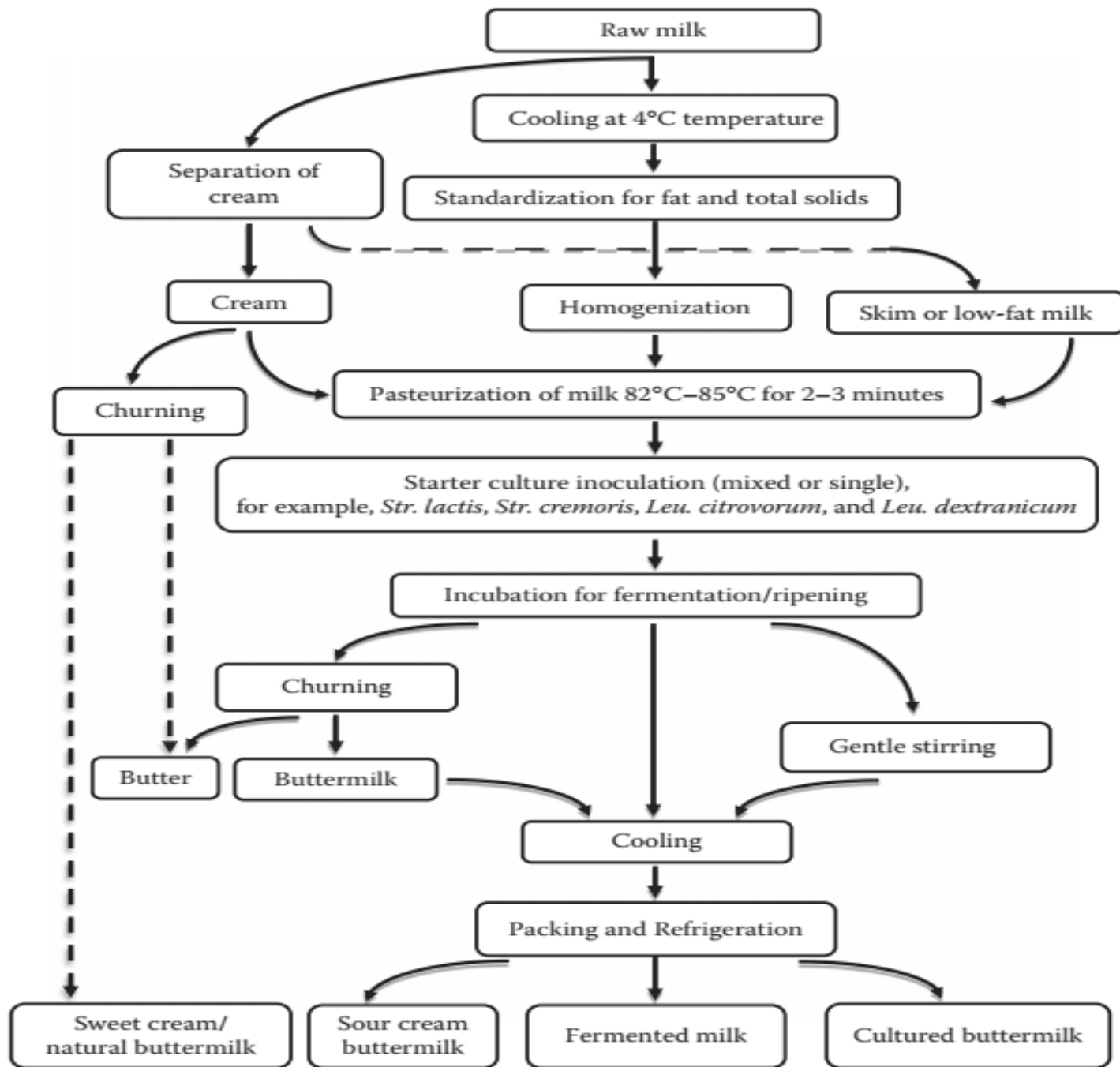
| Defect | Possible causes | Possible remedies |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Syneresis | Low SNF content High incubation temperature Low acidity (stirred yoghurt) Curd shrinkage (set yoghurt) Poor mechanical handling of the gel | Adjust formulation Reduce temperature to 42°C Ensure pH < 4.4 Check storage temperature Check stirring/pumping/filling temperature |
| Low viscosity | Low SNF content Excessive agitation | Adjust formulation Improve mechanical handling of the gel Add permitted stabiliser(s) Change culture to 'viscous' type |
| Gas bubbles | Excessive agitation Contamination with yeasts Coliforms present | Improve mechanical handling of the gel Eliminate source of infection Improve plant hygiene |
| Granulation | Undissolved milk powder Agitation prior to cooling High incubation temperature Seasonal variation in the milk | Adjust processing conditions Improve cooling and/or install sieve in pipeline Reduce temperature to 42°C Change starter cultures |
| Poor flavour | Insipid Unclean Bitter Sour Malty/yeasty | Change starter cultures Extend incubation time Check for coliforms Change starter cultures Lower the inoculation rate Check the storage temperature Suspect contamination and investigate source |

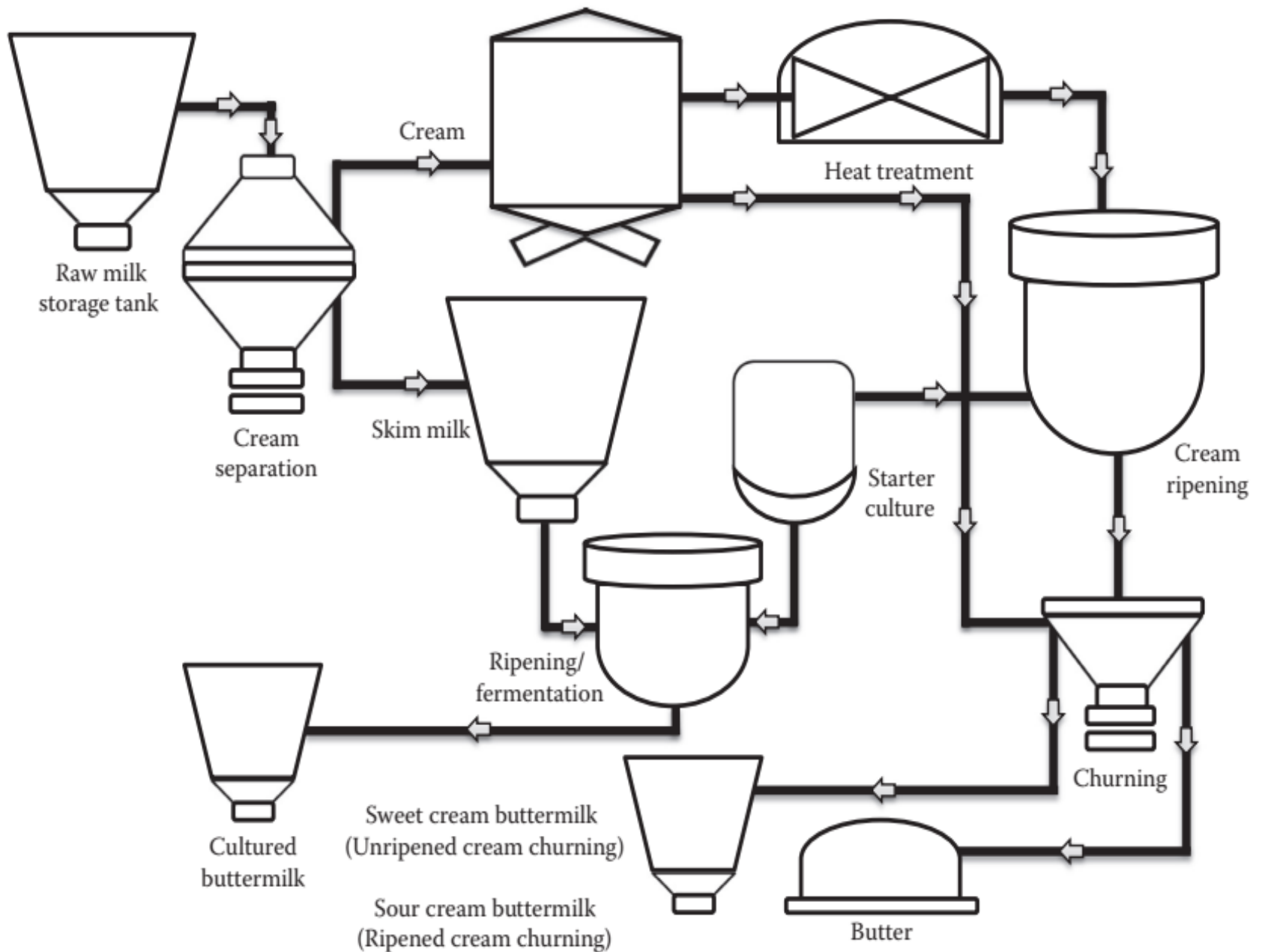
Adapted from Robinson *et al.* (2002) and Anon. (2002).



2- Cultured butter milk

- ❖ This product has most of the fermented milk solids except fat which goes in butter , It also has mixed lactic acid bacteria, especially *Lactococci* and *Leuconstocs* , which gives it a typical diacetyl flavour.
- ❖ True buttermilk is the fluid remaining after cream is churned into butter.
- ❖ Cultured butter milk is prepared by souring true butter milk or more commonly, skim milk with a butter starter culture that produces a desirable flavor and aroma.
- ❖ The next two slides showing the manufacture steps of cultured butter milk [2].

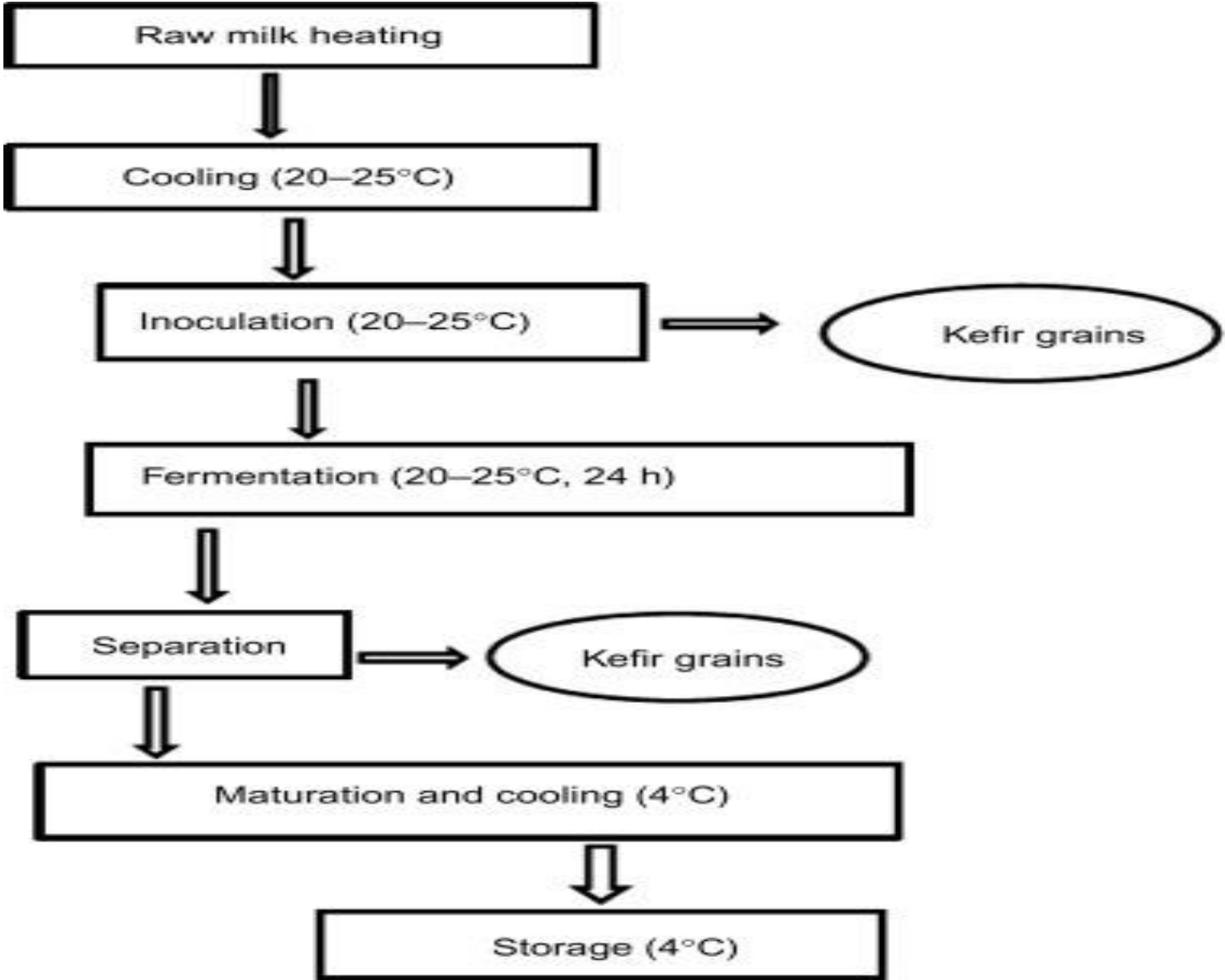




3- Kefir production

- ❖ it is a viscous, acidic, and mildly alcoholic milk beverage produced by fermentation of milk with a kefir grain as the starter culture .
- ❖ (FAO/WHO 2003), The Codex Alimentarius description of kefir state it as Starter culture prepared from kefir grains, *Lactobacillus kefir*, and species of the genera *Leuconostoc*, *Lactococcus* and *Acetobacter* growing in a strong specific relationship. Kefir grains constitute both lactose-fermenting yeasts (*Kluyveromyces marxianus*) and non-lactose-fermenting yeasts (*Saccharomyces unisporus*, *Saccharomyces cerevisiae* and *Saccharomyces exiguus*).
- ❖ The next slide shows the production steps of kefir [3].

Manufacturing steps :



References

- [1] Masanet, E., Brush, A. and Worrell, E., 2014. Energy efficiency opportunities in the US Dairy processing industry. *Energy Engineering*, 111(5), pp.7-34.
- [2] Kumar, R.A.V.I.N.D.E.R., Kaur, M.A.N.P.R.E.E.T., Garsa, A.K., Shrivastava, B.H.U.V.N.E.S.H., Reddy, V.P. and Tyagi, A., 2015. Natural and Cultured Buttermilk. *Fermented milk and dairy products*, pp.203-225.
- [3] Altuntas, S. and Hapoglu, H., 2019. Kefir-Type Drinks From Whey. In *Non-Alcoholic Beverages* (pp. 185-226). Woodhead Publishing.



With my best
wishes