

# Public acceptance of microbiome management practices in dairy cows

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- Scientists are developing new ways that utilize microbes to improve animal health and welfare and to mitigate environmental impacts of farming.
- Adopting these innovations successfully in dairy supply chains requires that they are accepted by the consumers.
- The aim of this study was to investigate public' acceptance of innovative microbiome management practices aimed at improving the health and welfare of calves, as well as addressing environmental concerns.





| # | Intervention                                                                        |
|---|-------------------------------------------------------------------------------------|
| 1 | Using colostrum to treat calves' diseases                                           |
| 2 | Providing probiotics to calves as a powder mixed with milk they drink               |
| 3 | Providing probiotics to calves by adding yoghurt or kefir                           |
| 4 | Keeping calves with their mothers                                                   |
| 5 | Adding algae or seaweed extracts to the feed to reduce dairy cow methane emissions. |
| 6 | Adding plant-based oils or fats to the feed to reduce dairy cow methane emissions.  |
| 7 | Adding chemical additives to the feed to reduce dairy cow methane emissions.        |





- An online survey conducted in July 2023 through a market research company.
  - A sample of 3 220 citizens from four EU countries (Finland, France, Ireland, and Poland, ~800 per country).
    - Representative of population in each country (gender, age, place of living)
  - The sample was divided into two subsets, which received different amounts of information on the same measures.
  - The participants rated their acceptance of each practice on a standardized scale from 1 to 5, where 1 represented "strongly disagree" and 5 represented "strongly agree."
  - Background information was asked
  - Descriptive analysis
  - Statistical analysis: Principal component analysis (PCA) to group attitudinal variables + Ordinary regression
- ➔ PCA components: familiarity with farming practices, food safety, environmental awareness, animal welfare, cost-conscious preferences, and social norm.

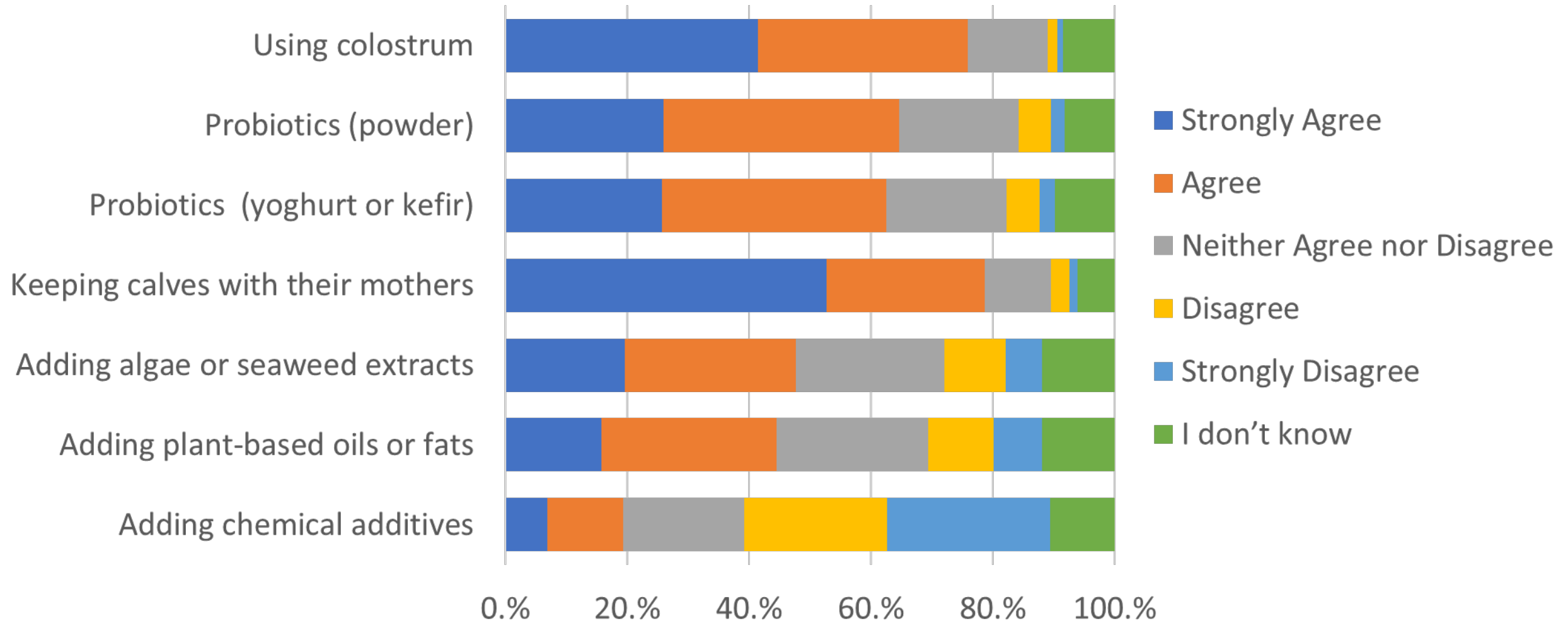


# HoloRuminant – Descriptive information



|                            |                             | Finland | France | Ireland | Poland |
|----------------------------|-----------------------------|---------|--------|---------|--------|
| Education                  | Less than primary education | 0.0 %   | 0.9 %  | 0.2 %   | 0.5 %  |
|                            | Primary education           | 3.8 %   | 1.7 %  | 1.1 %   | 3.2 %  |
|                            | Secondary education         | 22.0 %  | 23.3 % | 23.7 %  | 43.0 % |
|                            | Vocational education        | 21.5 %  | 27.9 % | 16.9 %  | 10.0 % |
|                            | University education        | 52.6 %  | 46.2 % | 58.1 %  | 43.3 % |
| Area of Residence          | City center                 | 22.0 %  | 35.6 % | 20.2 %  | 40.0 % |
|                            | Town or suburb              | 58.8 %  | 32.1 % | 51.1 %  | 39.2 % |
|                            | Rural area                  | 19.2 %  | 32.3 % | 28.7 %  | 20.8 % |
| Income                     | €0-€10,000                  | 7.0 %   | 10.8 % | 5.6 %   | 18.2 % |
|                            | €10,001 - €20,000           | 10.9 %  | 15.9 % | 9.9 %   | 34.7 % |
|                            | €20,001 - €40,000           | 19.1 %  | 36.6 % | 25.8 %  | 31.5 % |
|                            | €40,001 - €60,000           | 22.6 %  | 21.0 % | 22.3 %  | 8.5 %  |
|                            | €60,001 - €80,000           | 15.7 %  | 7.6 %  | 15.7 %  | 2.5 %  |
|                            | €80,001 - €100,000          | 12.8 %  | 3.4 %  | 11.1 %  | 1.2 %  |
|                            | €100,001 - €150,000         | 9.8 %   | 3.1 %  | 6.1 %   | 1.4 %  |
|                            | €150,001 or more            | 2.0 %   | 1.5 %  | 3.4 %   | 2.0 %  |
| Consumer of dairy products | No                          | 8.5 %   | 9.8 %  | 13.9 %  | 6.5 %  |
|                            | Yes                         | 91.5 %  | 90.2 % | 86.1 %  | 93.5 % |
| Consumer of meat           | No                          | 15.4 %  | 9.1 %  | 11.9 %  | 6.1 %  |
|                            | Yes                         | 84.6 %  | 90.9 % | 88.1 %  | 93.9 % |





# Association between acceptance of an intervention and selected variables



Upwards=positive association

Downwards=negative association

|                          | Colostrum | Probiotics powder | Probiotics yoghurt/kefir | Calves with the mothers | Algae/seaweed extract | Oils, fats | Chemical feed additive |
|--------------------------|-----------|-------------------|--------------------------|-------------------------|-----------------------|------------|------------------------|
| Familiarity with farming | ↗         | ↑                 | ↗                        | ↗                       | ↗                     | ↗          | ↗                      |
| Food safety              | ↗         | ↗                 | ↗                        | ↑                       | ↘                     | ↘          | ↓                      |
| Environmental awareness  |           |                   |                          |                         | ↗                     | ↗          |                        |
| Animal welfare           | ↘         |                   |                          |                         | ↗                     |            | ↗                      |
| Cost consideration       | ↗         |                   |                          | ↗                       | ↗                     | ↗          |                        |
| Social norms             | ↗         | ↗                 | ↗                        | ↗                       | ↗                     |            |                        |
| Age                      |           | ↘                 |                          | ↗                       |                       | ↘          | ↓                      |
| Female                   | ↗         |                   |                          | ↗                       | ↘                     | ↘          | ↓                      |
| Education                |           | ↑                 | ↑                        | ↑                       |                       |            |                        |
| Income                   | ↑         |                   |                          |                         |                       |            |                        |
| Meat consumption         | ↗         |                   | ↑                        |                         |                       |            |                        |
| Dairy consumption        |           |                   | ↑                        |                         |                       |            | ↓                      |
| Residence area           |           |                   | ↘                        | ↘                       | ↘                     |            | ↓                      |
| <b>More information</b>  | ↘         | ↘                 | ↘                        | ↓                       | ↓                     | ↓          | ↗                      |
| Finland                  | ↑         | ↗                 | ↑                        | ↗                       |                       | ↑          | ↗                      |
| Ireland                  | ↗         | ↗                 | ↗                        |                         | ↑                     | ↑          | ↑                      |
| Poland                   | ↗         | ↗                 | ↗                        |                         | ↗                     | ↑          | ↗                      |



- Prolonged cow-calf contact was the most acceptable measure among tested interventions in all countries.
- There was a statistically significant difference in the acceptance levels between practices that use natural and chemical feed additives, with European citizens being more reluctant to use the latter.
- With the exception of the use of chemical additives, the provision of additional information to participants led to a decrease in the acceptance of the measures.
- Results can inform policy and business measures





*Thank you for your attention*

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