



# **Factors affecting the success of test milking and milk sampling in milk recording in Finnish AMS-farms**

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# ProAgria

- ✓ The largest agricultural advisory organization in Finland
- ✓ Milk recording services to dairy farms, leadership-, planning-, monitoring-, development- and consulting services to all farms
- ✓ 8 regional Finnish ProAgria Centres
- ✓ Farmer owned and independent



# ProAgria



Customer base

**85%**

of all Finnish farms



Staff

**650** pers.

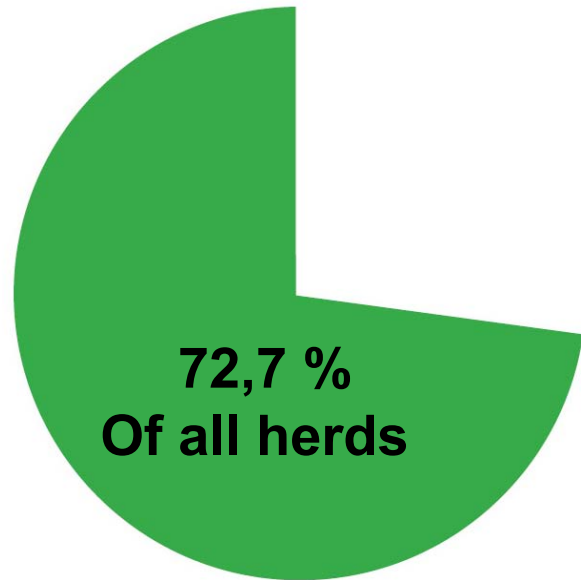


Turnover

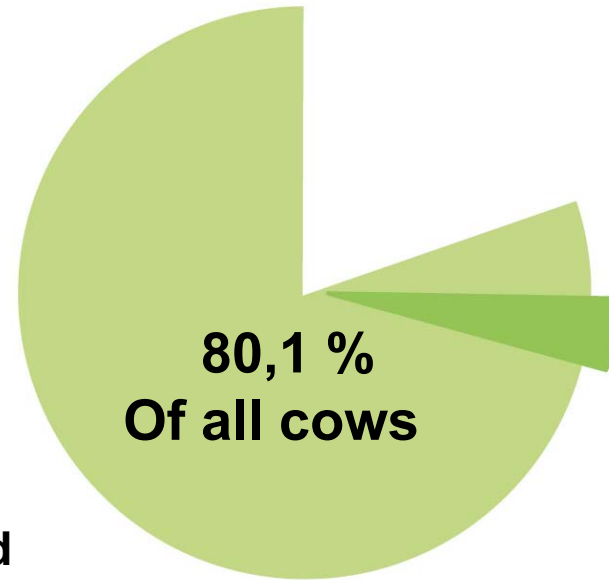
**€50** million euros

# Dairy cattle milk recording 2023

3 173 herds



189 148 cows

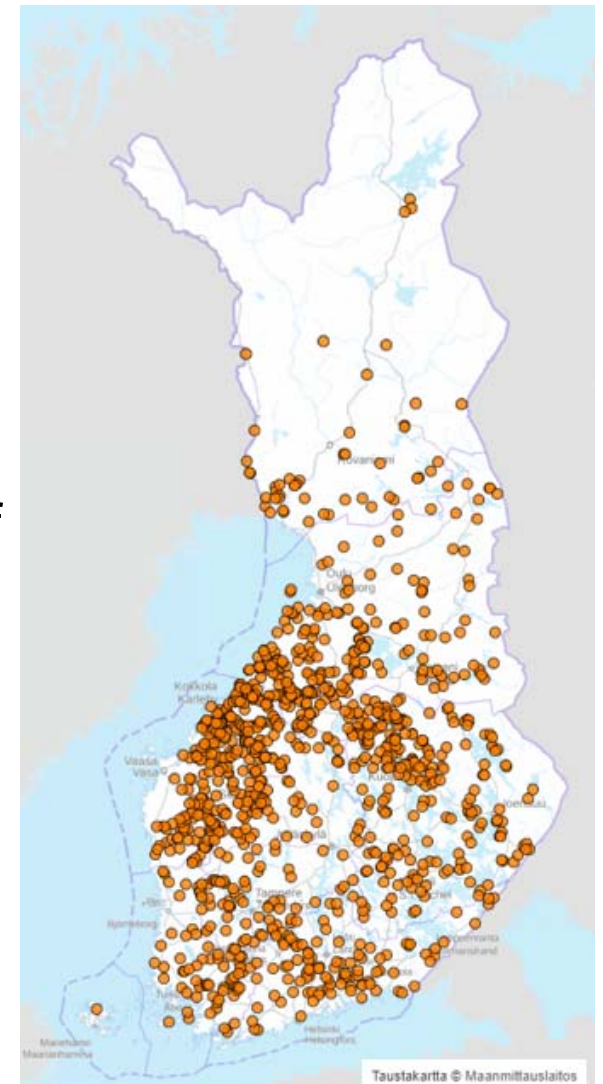


Cows / herd

59,6

# Milking robots in Finland

- The **number of automatic milking farms (AMS)** in Finland in 2021 was 1328, which was approximately  $\frac{1}{4}$  of all dairy farms
- 84% of these were in milk recording
- The total number of milk recording farms was 3755, of which 29% were AMS farms
- \*The **number of milking robots** increased approximately 130 per year between 2010 and 2020
  - => 2021: 118 new robots
  - => 2022: 85
  - => 2023: 48



Picture: Mtech Oy, 2021. Map: Maanmittauslaitos.

# Milking robots in Finland

- 52% of milk from milk recording farms was milked with a robot in 2021
- By 2035, up to 80% of milk recording milk will be milked by robots



# AMS milk sampling in Finland

- Farms mostly do it on their own, with their own sampling devices
- The sampling device is connected to the robot only during milk sampling
- AMS farms usually use barcoded milk sample vials
  - In 2025 all the farms must use only barcoded vials
- The cow's ID is linked to the barcode by scanning
- Milk quantities are recorded and sent to the milk recording database
- The vials are sent with the milk tankers to the dairies' laboratory for analysis



# AMS milk sampling in Finland

- The laboratory analyzes the samples for fat, protein and somatic cells
- => The analysis data to the milk recording's database, where they are combined with the milk quantities sent by the farmer
- A pregnancy test can be chosen as an additional analysis



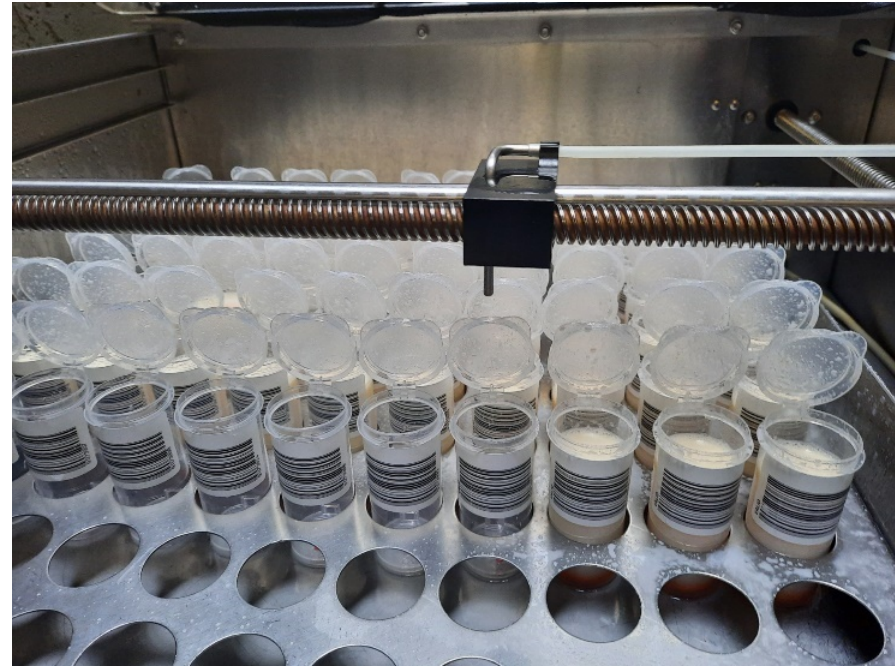


# Successful milk sampling

- The sample must be taken from the right cow
- The sample must represent the entire milk amount
- The animal's ID / information must be entered correctly
- A sufficient sample must be obtained, and it must be of good quality
- The sample must be kept cold, it must be delivered to the laboratory without delay, and it must remain good and analyzable until the moment of analysis
- The analysis result must focus on the right amount of milk from the right cow and the time of day
- The analysis result must be connected to the correct amount of milk from the right cow and to the correct date and time

# Samplers used on farms

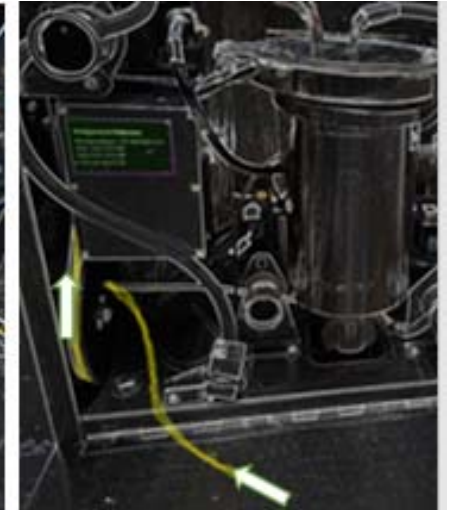
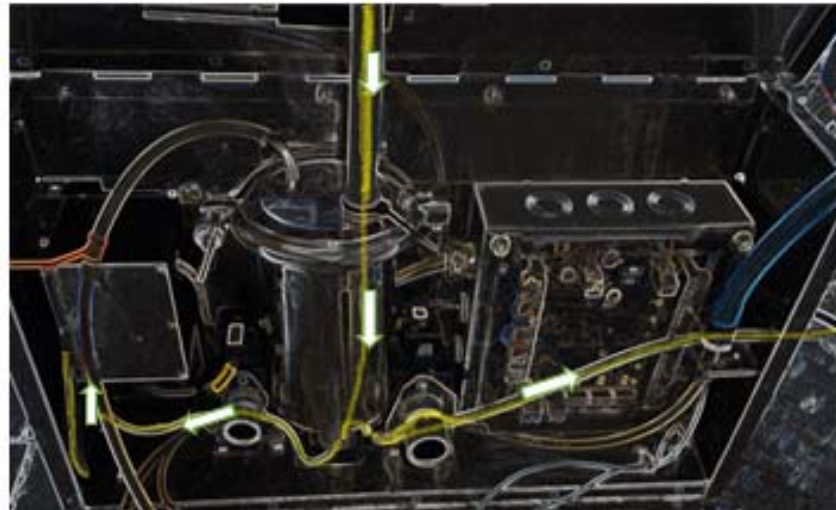
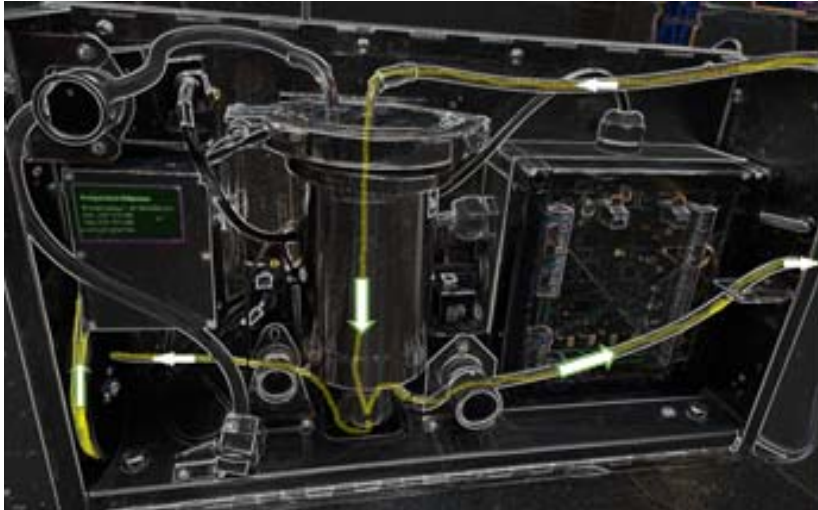
## DeLaval



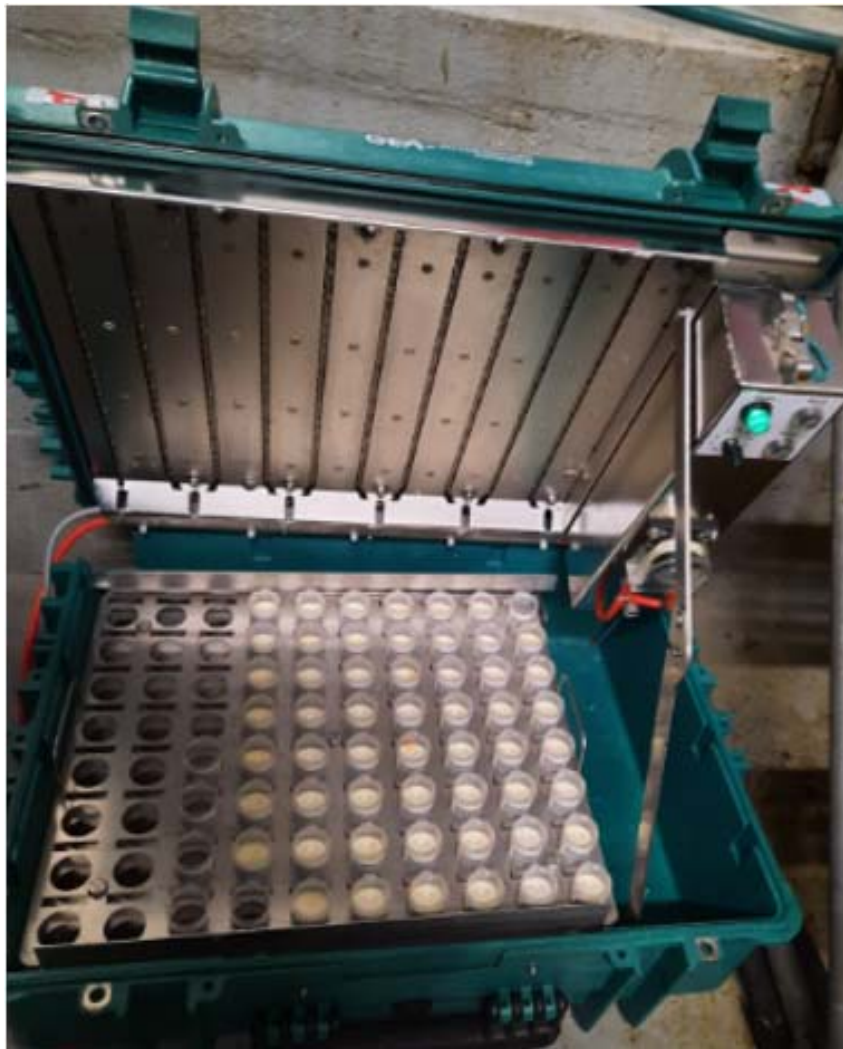
# Samplers used on farms



# DeLaval

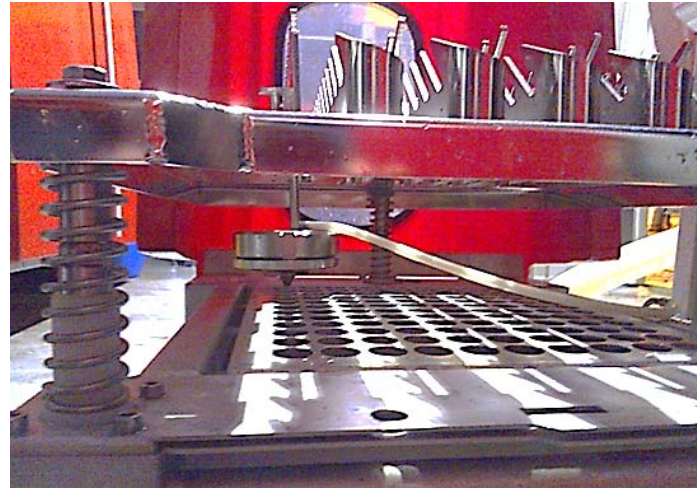
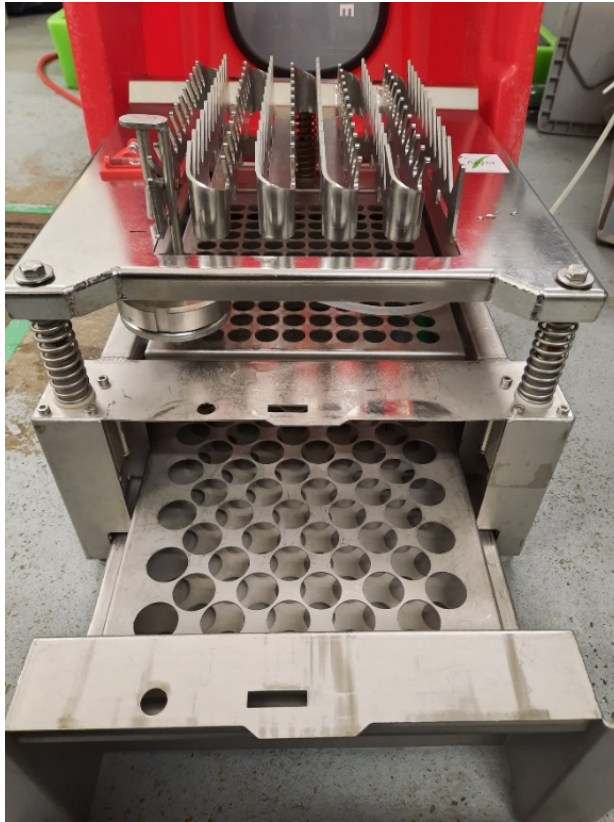


# GEA

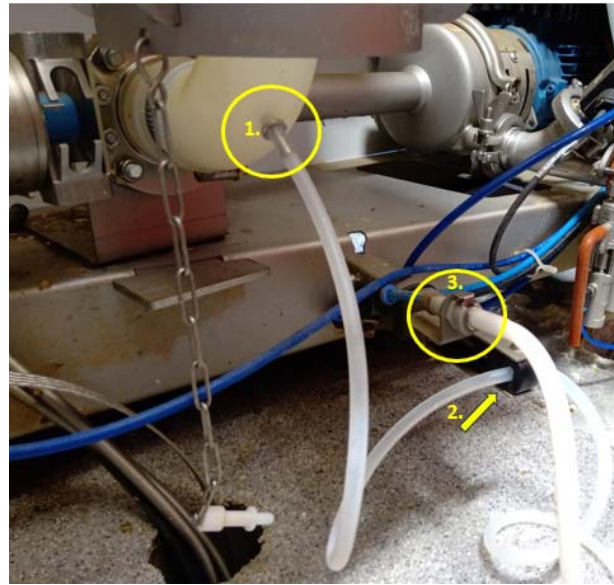


ProAgria

# Lely Shuttle A



# Lely Shuttle A



# Lely Sampler (Ori-collector)





# Our goal was

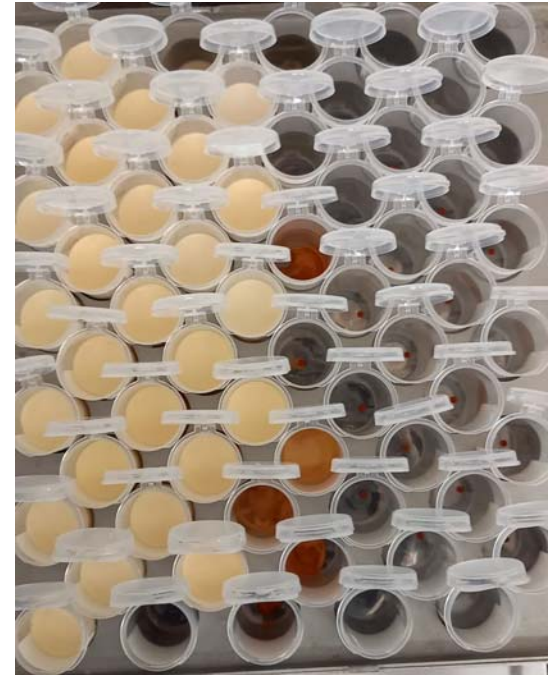
- To find out the status and challenges of milk sampling in automatic milking farms
- To find out the factors affecting the success of milk sampling
- Based on the results, to find out solutions to facilitate sampling
- To find out which issues should be paid attention in farm counseling for the success of sampling and the development of our services, and whether farms need related services, support or guidance
  - It was known that experiences about the smoothness of the process vary
  - The assumption was that sampling is often laborious and problematic, and there are often challenges

# Survey for robot farms

- Survey by using Webropol at spring 2021
- The target group was the automatic milking farms that are customers of milk recording nationwide, also Åland and Swedish-speaking regions
- Webropol link was sent to 1256 email addresses
- Personal reply link, only one answer
- Answer possible in Finnish and Swedish
- Response time one week
- We got 462 responses
- The response rate was 36,8 %

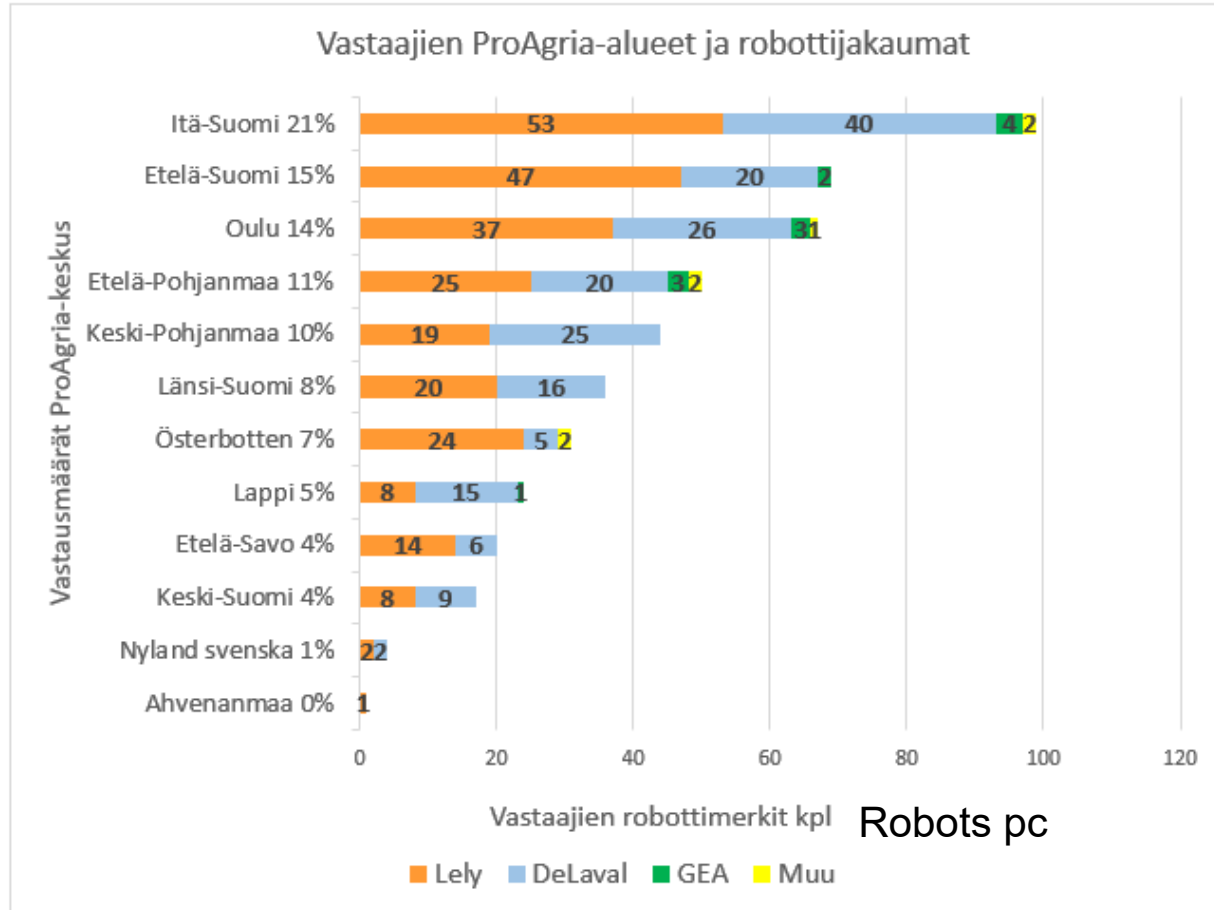
# The most common sampling challenges on an AMS farms

- Human errors
- Right cassette numbers and remembering to change them
- Incorrect milking times and date
- Overfilling the vials
- Overflowing container and emptying problems
- Empty sample vials
- Insufficient mixing => fat deviation
- Power cuts



# ProAgria centres and robots

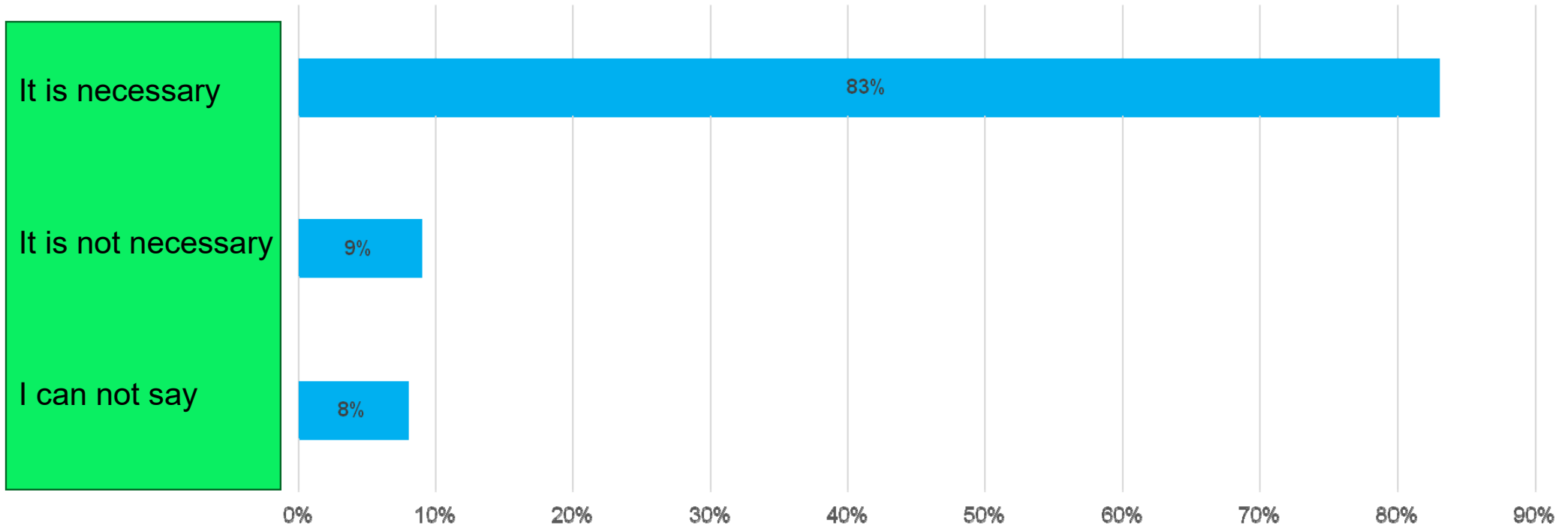
East  
South  
Oulu  
South Ostrobothnia  
Central Ostrobothnia  
West  
Österbotten  
Lapland  
South Savo  
Middle Finland  
Nyland svenska  
Åland



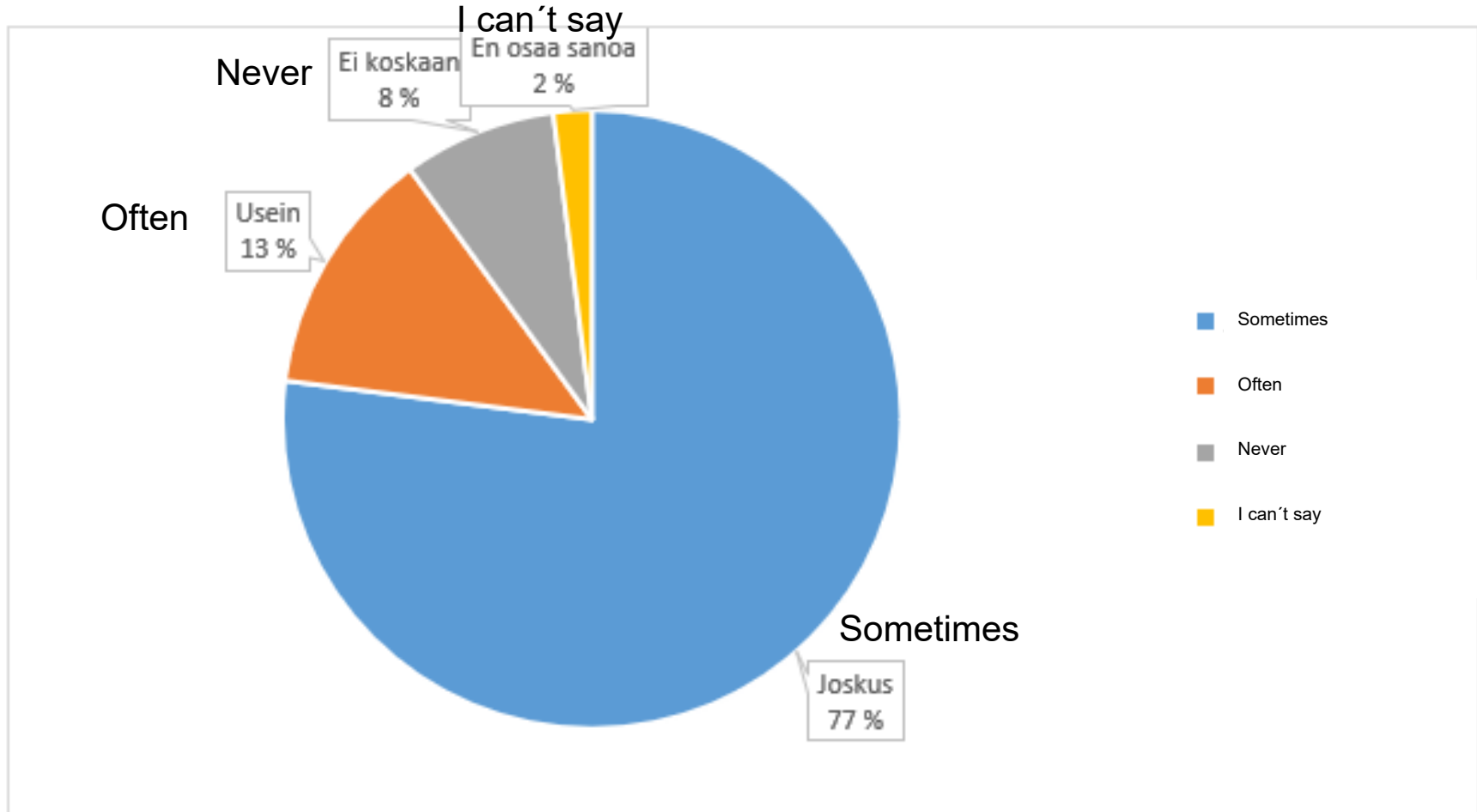
# Number of robots

Robots	Answers	%
1	291	63
2	125	27
3	34	7,4
4 or more	12	2,6

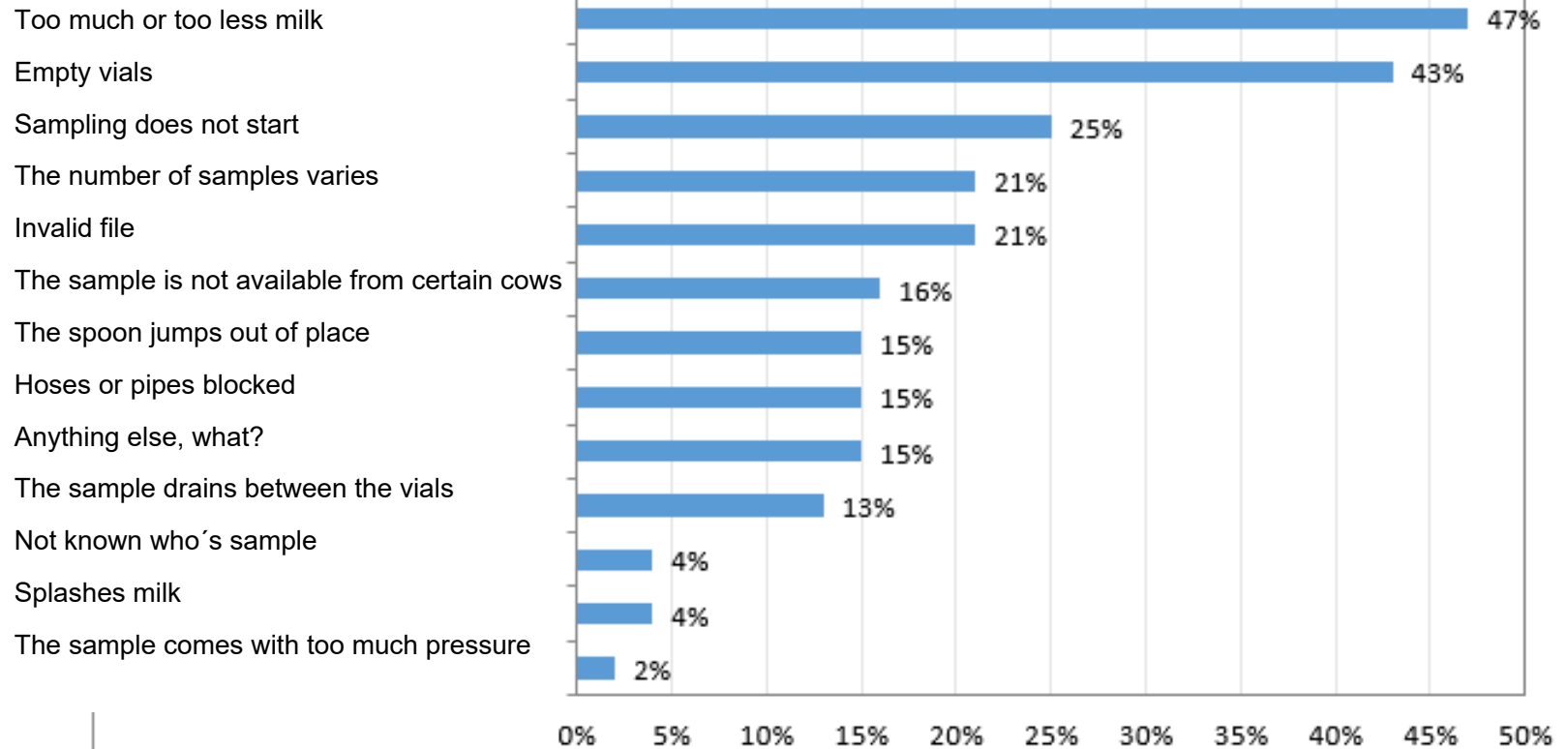
# Is milk sampling necessary



# There are problems with sampling



# The reasons for the challenges





# The needs of services

- 85% of the respondents felt that they do not need a sampling service
- The remaining 15 percent (69 respondents) were interested or already using the service
- Only 13 percent (58) could consider renting a sampling device
- 70 percent of the respondents had no need for any support or guidance
- The remaining 30 percent (137 respondents) needed help creating or interpreting My Farm reports and sending data
- In addition, there was a need for instructions on how to use the milking robot's program, finding information from the robot's computer, and interpreting reports from ProAgria's Web services

# Open answers

- Answers from 85 respondents
- They highlighted the need for support during sampling, which would be easily and quickly available just when the situation is acute
- Some of the respondents described their sampling process and reasons for successes or challenges
- Under 4 percent wished that the fat, protein and somatic cell count data obtained from the robot could be accepted for milk recording without the need to take separate milk samples
- In addition, there was feedback about other services for ProAgria and Mtech as well as for some individual other operators

# Review of responses

- Milk sampling of milk recording was felt to be an important
- The assumption was that most of automatic milking farms would find sampling often laborious and would have problems with it. And that the number of farms that consider sampling necessary has decreased in the next few years and sampling problems have increased
- However, the answers showed that only a small part find it often laborious and often problematic
- On the other hand, it is not known how many of the farms that have often and many challenges in milk sampling did not respond to the survey
- The answers to the survey (462) represented about a tenth of the milk recording farms and a good third of the milk recording robot farms

# Conclusions

- In most of the farms that answered the survey, sampling goes well, and problems only occur sometimes
- Among the challenges, the most common was too much or too little sample and that the vials remain empty
- Sampling starting problems were an unexpected cause of failure
- The importance of the power cut to the failure was also emphasized a lot and it may also be a part of the reason for the previous one
- The importance of the cleanliness and good condition of the hoses and pipes of the sampling device to success was noticed

# Conclutions

- The same problem is not necessarily caused by the same reason in all farms
- The answers showed that in all problem areas there was no information about the operating methods, clear instructions were missing, or they were not read
- There would be a need for a checklist for different work phases to ensure success
- There would also be an order for technical telephone service/advice
- Many technical problems of sampling could only be solved by regular and thorough maintenance of the equipment and more frequent sampling, which would make the work more routine
- Sampling should be discussed more with farmers and basic issues should be made better known by training



**Thank you!**

