

R4D project - 100 best practices for resilient dairy farming in Europe

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R4D Resilience 4 Dairy



Università di Pavia





Resilience for Dairy (R4D) has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101000770



Resilience
4 for
Dairy

Resilience4Dairy:
Sharing knowledge to improve sustainability
and resilience of the dairy sector

EU projects on resilience



- Focusing on **farmers** practical issues affecting future sustainability of dairying
- Involving farmers in the definition of resilience



Resource
Efficiency



Animal
Care



Socio-
Economics



Biodiversity



The EIP R&R Focus Group

What is resilience?

EIP Focusgroup - 2016-2018



7 R&R enhancing factors



- A sustainable robust and resilient dairy production system **can recover from, or adapt to, changes** in environmental, social or economic conditions
- 3 levels: cow, farm, dairy sector

General objectives of R4D Thematic Network

Resilience

Robustness

Sustainability

3 expertise areas (3 *Knowledge Areas* KA) =

Economic
and social
resilience

Technical
efficiency

Environment,
welfare and
society



freepik





The consortium



16 countries, 18 partners





R4D objectives

Which pathways and solutions to remain a dairy farmer in Europe tomorrow?

- Develop a **Multi-stakeholder participatory** approach to identify and relevant **needs** on resilient dairy farms
- Collect, **assess**, test, exchange and publish **100 solutions** to improve the resilience of dairy farmers, farms and sector
 - tailored to answer farmer's specific needs and society's expectations

R4D approach:

Step 1

- Creating the 16 National Dairy Akis (NDA)
- Creating the Pilot Farm network (120 farms)

Step 2

- Collecting farmers needs
- Collecting NDA solutions

Step 3

- Matching needs and solutions: Creating national workplans

Step4

- Selecting most promising solutions (experts)
- Ranking= NDA/farmers

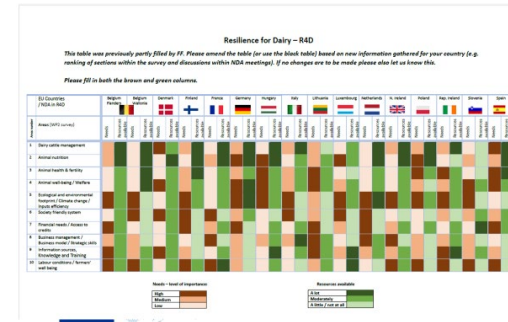
Step 5

- Assessing and/or testing solutions
- Adapting the solutions validated

Step 6

- Delivering **Ready-to-use Best Practices** (leaflets, webinars, videos, social networks)

- Identifying knowledge gaps & needs for further research



+200
solutions



100 Best Practices



23.05.2023 | Video

Dirk and Griet Vandecandelaere keep 110 dairy cows. They have a very efficient young stock management. In order to control the growth of the heighers they measure their weight on a regular basis. This allows them to reach the first calving age at 24 months.

Subtitles EN

 WATCH THE VIDEO

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 R4D Best Practice: Young stock weight measurement

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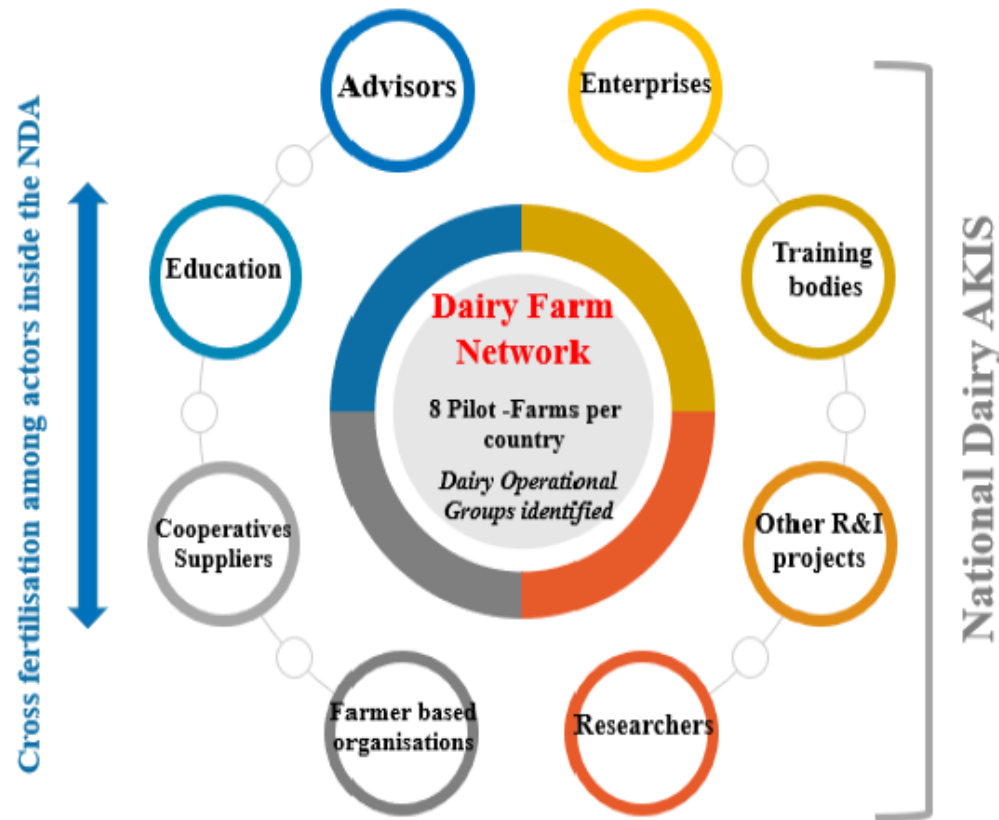
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Structure of the project

In each country, a national steering committee named **National Dairy Akis (NDA)**

With a facilitator named **Farm Facilitator (FF)**

- Express the needs
- Implement tests and demos
- Organise exchanges (country and project levels)



Implementing farmers EU workshops and cross visits

60 to 120 people
X 5 EWS



1,214 actors
involved



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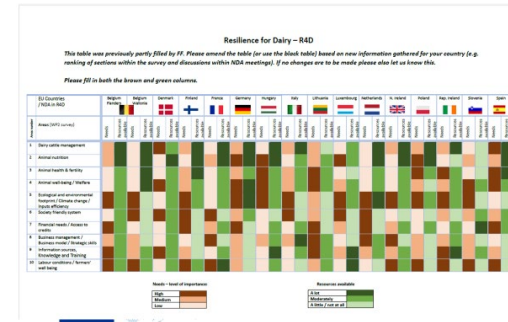
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 **R4D Best Practice: Young stock weight measurement**

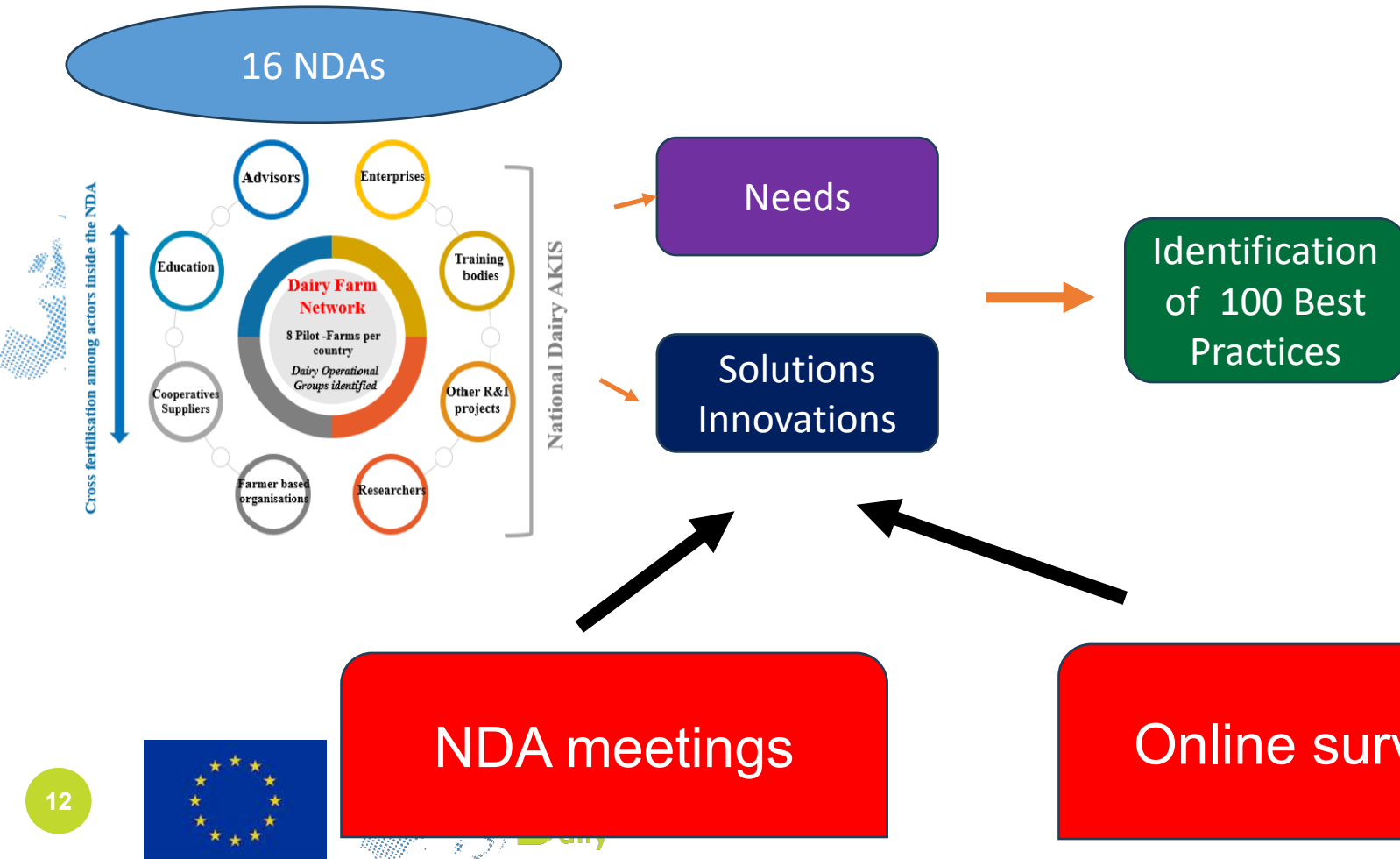
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Collecting farmers most urgent needs and solutions. Creation of National Workplans



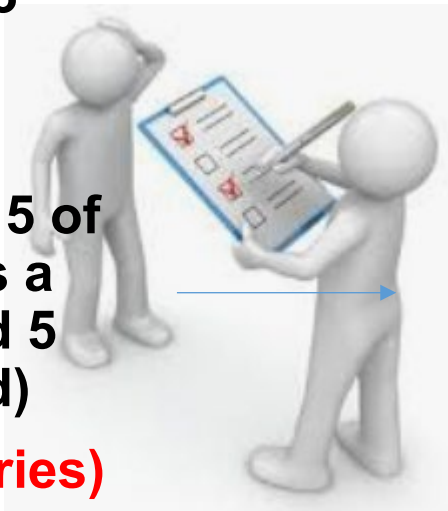
To provide innovative solutions, one must understand the needs.

- Collection of the strongest expectations of farmers (and their advisors) in the 16 countries
 - **Online survey**
 - **Physical meeting**
- Initial list based on literature, former EU projects, feedbacks from partners and farmers
- Formatting and sorting of needs by field through voting and discussions
- Field visits in the region and in Europe "to see and understand"



Online survey 2022

- 43 proposals of themes/needs (10 chapters divided into 43 specific topics)
- Rated from 0 to 5
- Results (Top 5 and Bottom 5 of the vote/43) – expressed as a percentage of ratings 4 and 5 (interested / very interested)
- 535 respondents (16 countries)
- Not evenly spread (Irl 9, B Fla 91)



Economic and social resilience	FINANCIAL NEEDS
	BUSINESS MANAGEMENT: IMPROVE STRATEGIC SKILLS AND BUILD ROBUST BUSINESS MODELS
	INFORMATION SOURCES, KNOWLEDGE, TRAINING
	LABOUR CONDITIONS
Technical Efficiency	DAIRY CATTLE MANAGEMENT (housing, genetic, feeding system,...)
	ANIMAL NUTRITION
	ANIMAL HEALTH (and fertility)
Environment, welfare and society	ANIMAL WELFARE
	ECOLOGICAL AND ENVIRONMENTAL FOOTPRINT/MITIGATION OF CLIMATE CHANGE/INPUTS EFFICIENCY
	SOCIAL ISSUES: BUILD SOCIETY FRIENDLY SYSTEM





R4D - NEEDS & SOLUTIONS

Resilience for Dairy (R4D) is an EU-funded project that will develop and strengthen a sustainable EU Thematic Network on "resilient and robust dairy farms". The newly developed thematic network will address both the needs and solutions to those needs of the EU bovine dairy sector, enabling the exchange of practical and scientific knowledge among European dairy farmers, researchers and other relevant stakeholders. In this context, we ask for your contribution by completing the following questionnaire, which has the purpose to identify the main needs/solutions perceived by stakeholders in order to improve overall farm resilience.

resilience4dairy@gmail.com [Switch accounts](#)

*Required

Email *

Your email address

Next

Page 1 of 7

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I. Dairy cattle management

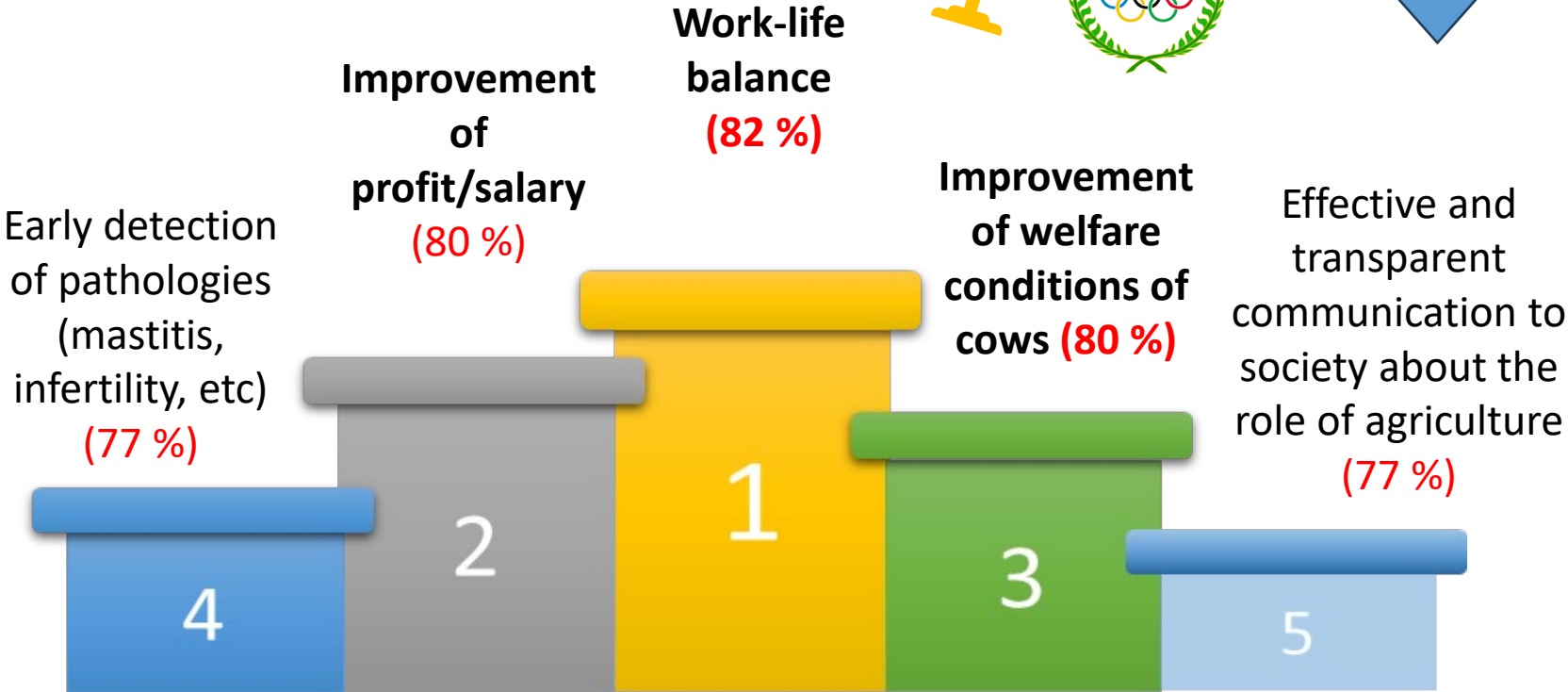
Housing, genetic, feeding system, etc.

Please rate your interest from 0 (no interest) to 5 (very interested) for the following needs/solutions for improving farm resilience *

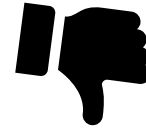
	0	1	2	3	4	5	I don't know
Innovative milking devices (e.g. robots)	☐	☐	☐	☐	☐	☒	☐
Innovative milking strategies (e.g. extended lactation)	☐	☐	☐	☐	☐	☒	☐
Innovative feeding systems for calves (feed composition, preparation and distribution)	☐	☐	☐	☐	☐	☒	☐
Innovative feeding systems for cows (feed composition, preparation and distribution)	☐	☐	☐	☐	☐	☒	☐
Individual/herd milk yield estimator/recorder	☐	☐	☐	☐	☐	☒	☐
Innovative							

Online survey on the needs of European dairy farmers – R4D

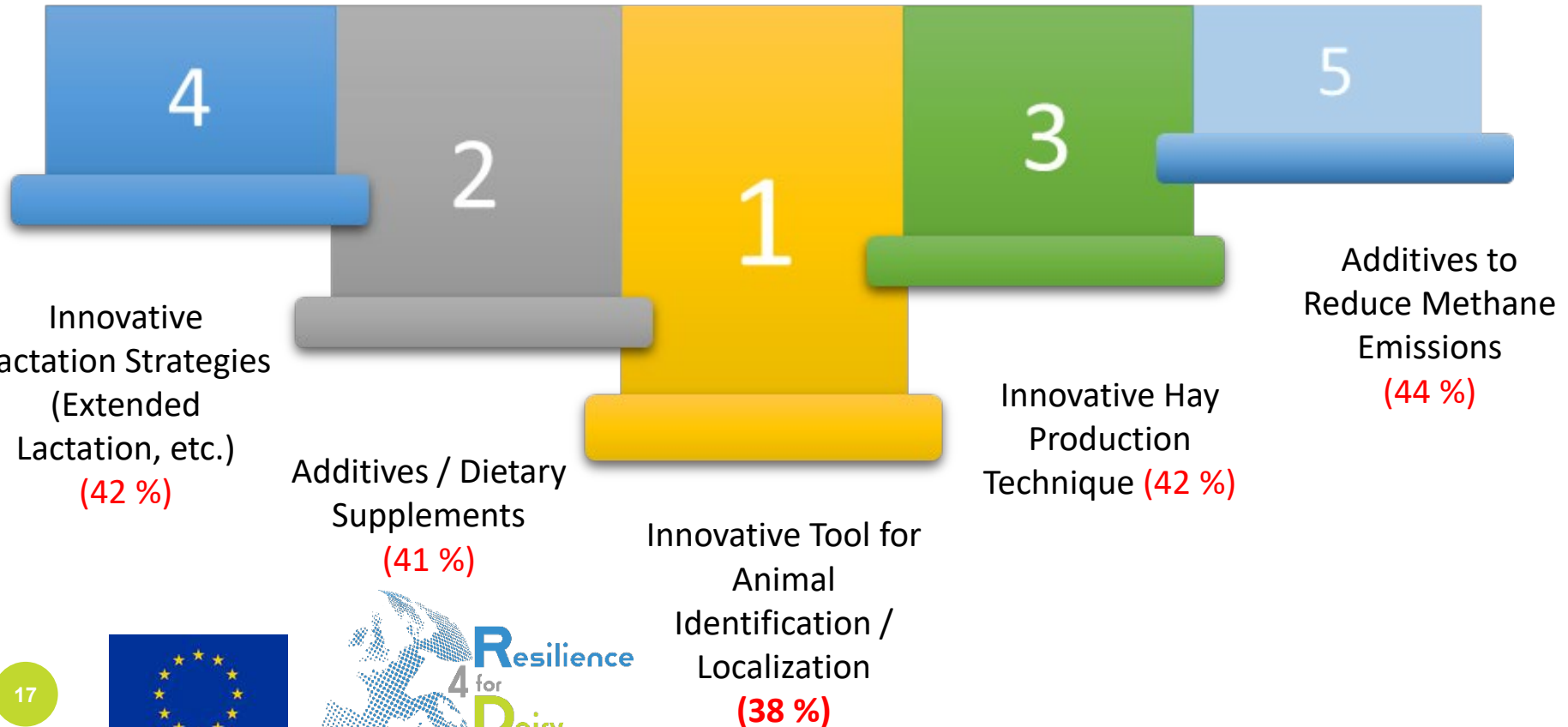
Results 16 countries



Online survey on the needs of European dairy farmers – R4D



Results 16
countries



Some specific investigations by cluster

- Farmers (379) vs non farmers (156) :
 - welfare condition of cows ranks 1 (just above work/life balance)
- Farm dimension over 100 cows (170)
 - Improvement of welfare conditions of calves ranks 4th
- Over 40 yrs (371)
 - Effective communication and transparency to the general public ranks higher (5th)
- Female (125) / Male
 - 1-work/life balance; 2-3-4 : welfare condition of cows, calves and animal friendly buildings
- Level of education: little impact



Results by country/area

Searching for Dairy Farm Resilience with the R4D Project: Innovation Needs to Be Sustainable

by Ewa Kołoszycz ¹ , Artur Wilczyński ¹ , Alberto Menghi ² , Chiara Serena Soffiantini ²  and Marija Klopčič ^{3,*} 

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- ² Centro Ricerche Produzioni Animali—CRPA Soc. Cons. p.A., Viale Timavo 43/2, 42121 Reggio Emilia, Italy
- ³ Department of Animal Science, Biotechnical Faculty, University of Ljubljana, Groblje 3, 1230 Domžale, Slovenia
- * Author to whom correspondence should be addressed.

Sustainability **2024**, *16*(9), 3520; <https://doi.org/10.3390/su16093520>

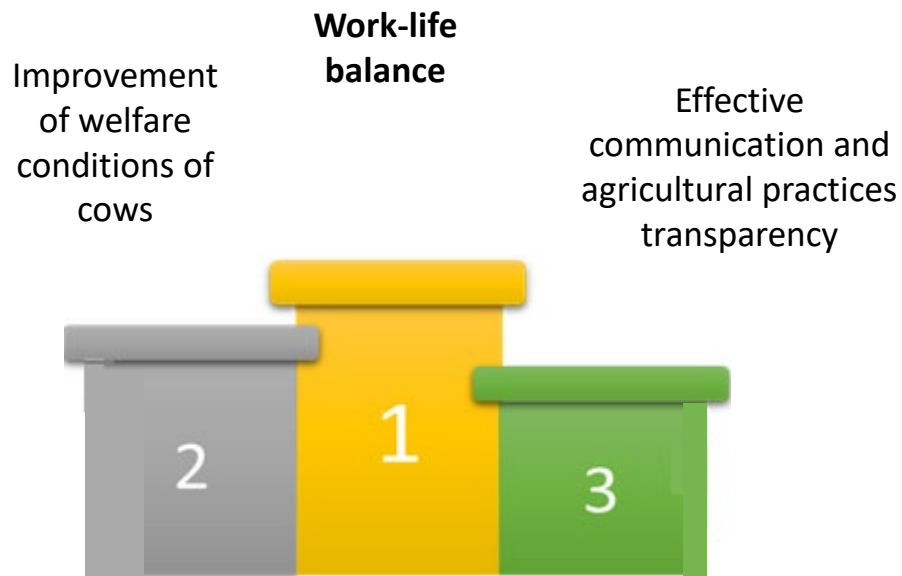
Submission received: 9 March 2024 / Revised: 15 April 2024 / Accepted: 17 April 2024 / Published: 23 April 2024

Western Europe vs. Central and Eastern Europe

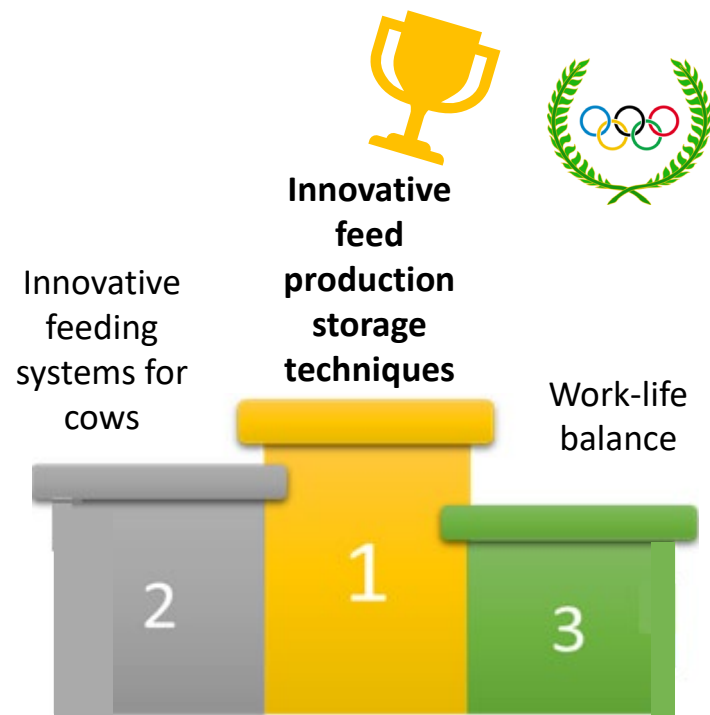
438	Belgium	Lithuania	97
	Denmark	Poland	
	Finland	Slovenia	
	France	Hungary	
	Germany		
	Ireland		
	Italy		
	Luxembourg		
	Netherlands		
	Northern Ireland		
	Spain		



Online survey on the needs of European dairy farmers – R4D

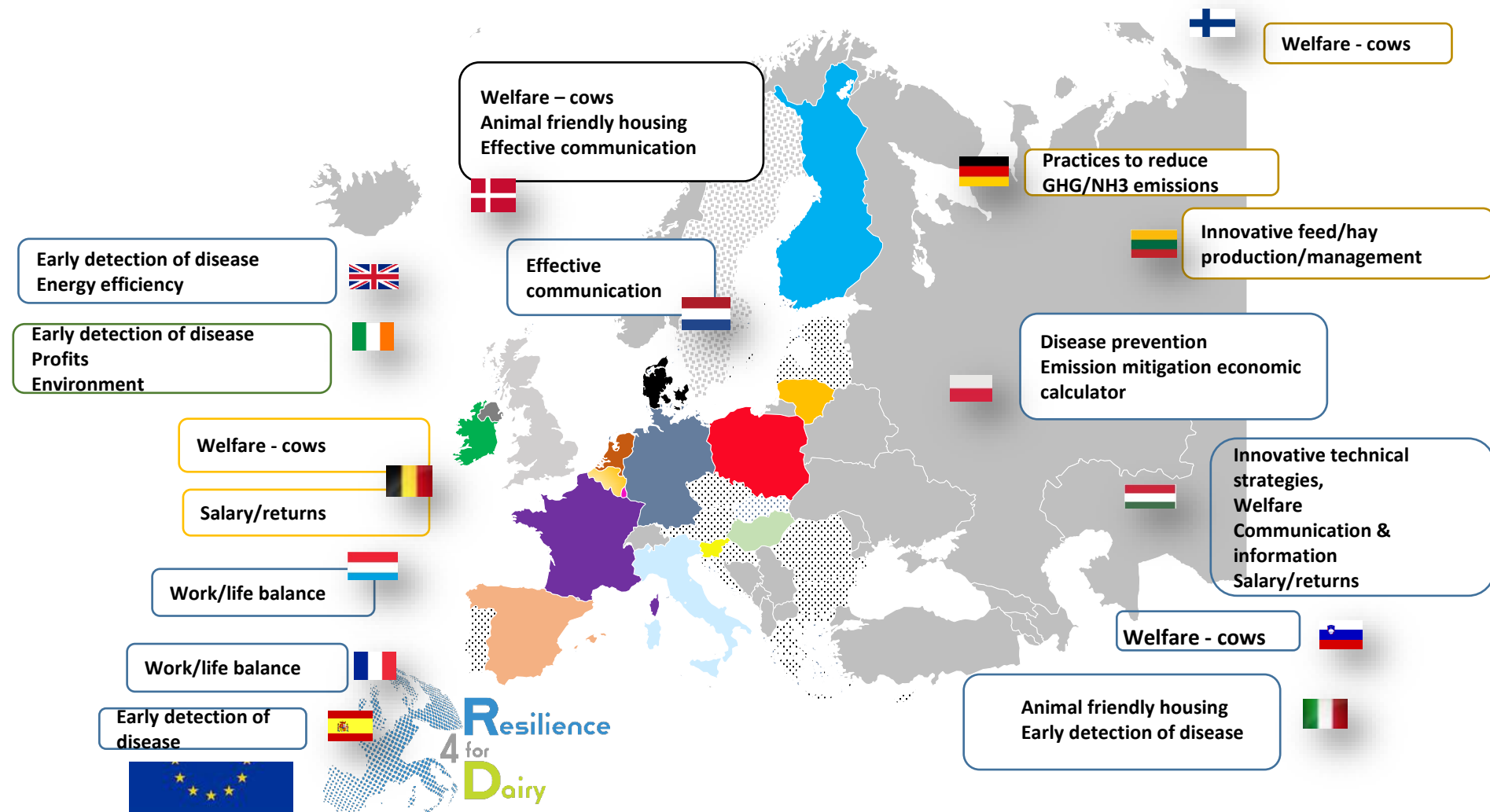


**Western Europe
(N=438)**



**Central and Eastern Europe
(N=97)**

Top need for each country based on survey

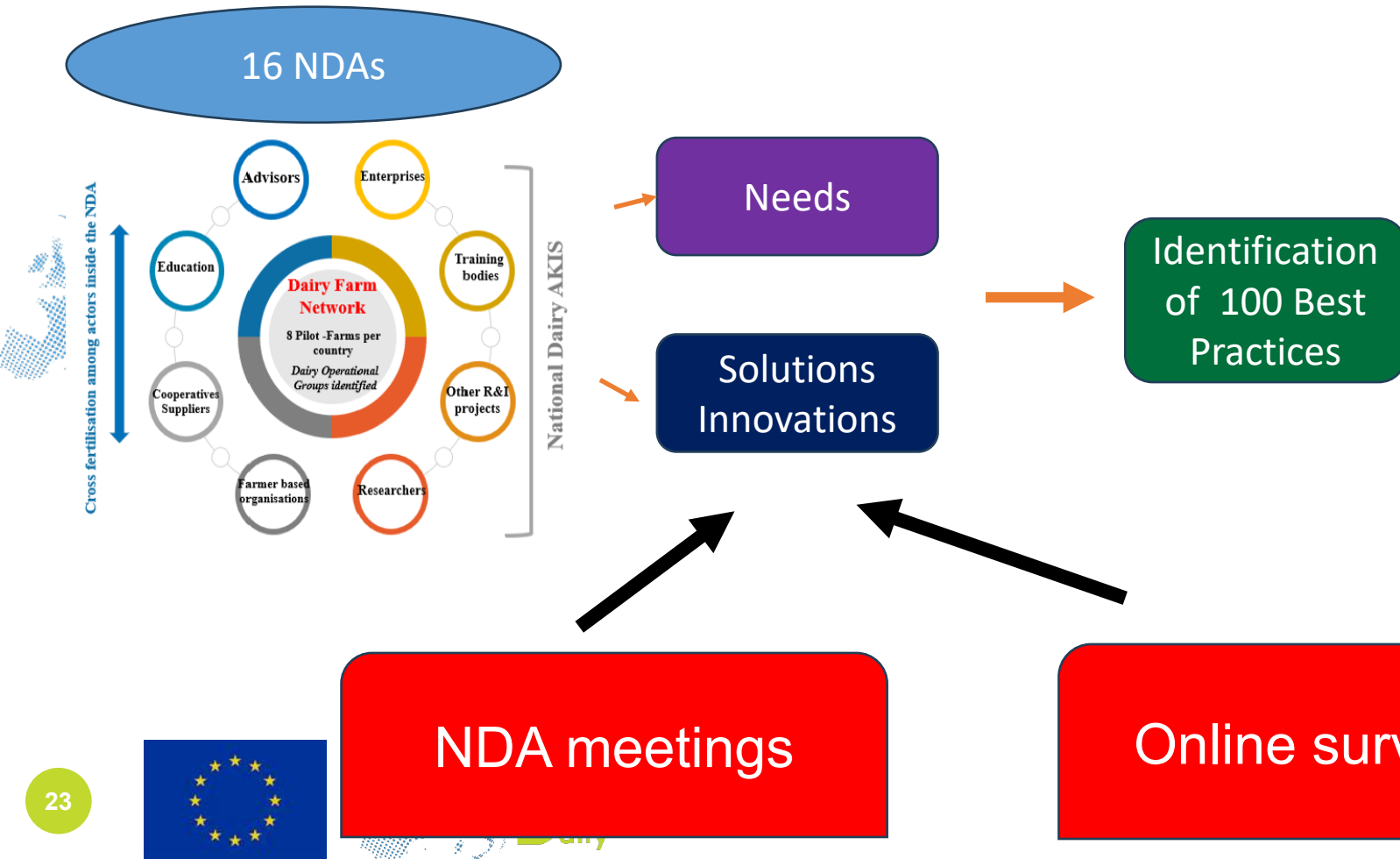


Survey on Needs: Conclusions

- The ranking shows the variety of needs that farmers have to face
- The main themes are:
 - farmers welfare (work-life balance)
 - animal welfare and health (prevention)
 - communication with civil society
 - environmental sustainability (renewable energy)
- “Work-life balance” is always in the first 3 top positions regardless of clusters



Collecting farmers most urgent needs and solutions. Creation of National Workplans



Needs

Needs identified in NDA meetings



Most often mentioned: Labour conditions, environmental and social issues

Top 1 needs in detail

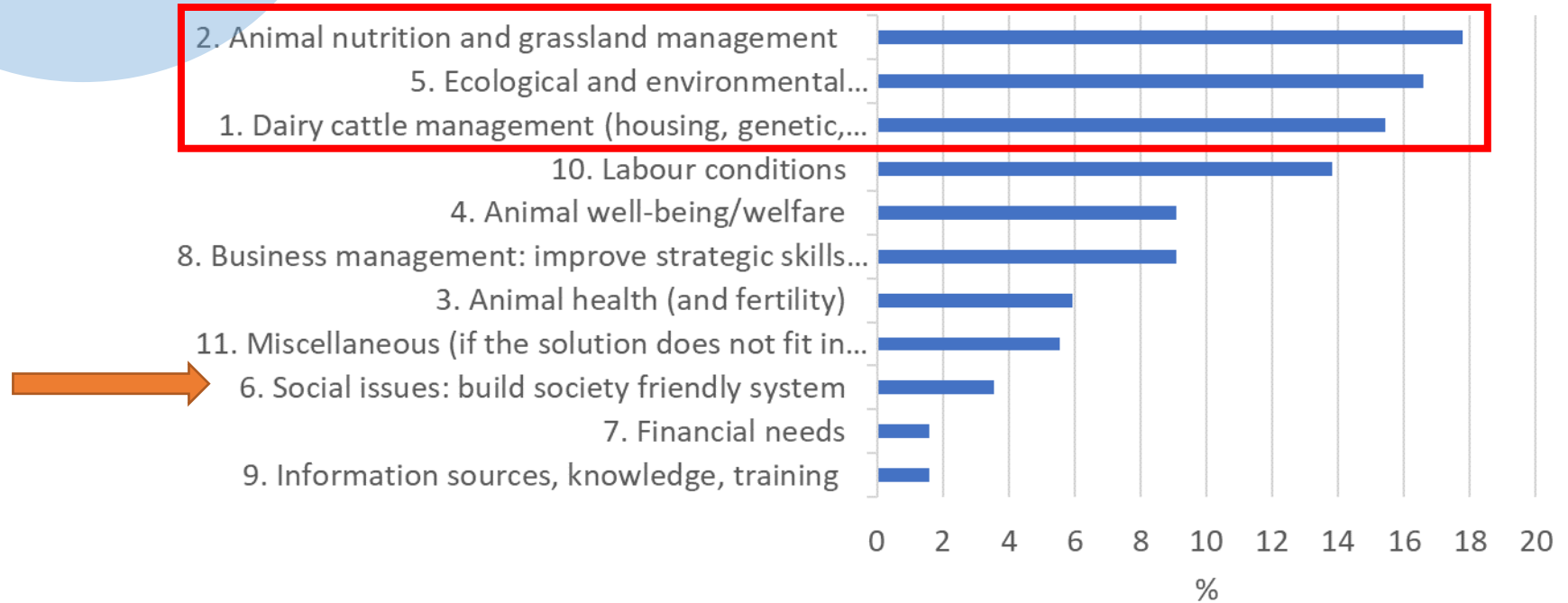
Labour conditions

- Well-being of farmers
 - work-life balance
 - mental health
 - social relationships, partnership relations
 - economy
 - family and generations
- Farmers' entrepreneurship
 - skills as a manager, work organisation
- Cooperation with other farmers
 - share tools, technologies and workload
 - peer group support



Solutions

Solutions identified in NDA meetings



Most often mentioned: Animal nutrition, environment and dairy cattle management

Solutions proposed, in detail

Animal nutrition and grassland management

- Feeding
 - Protein self-sufficiency
 - Optimization/reducing of protein feeding
 - Novel feeds
- Grass/forage
 - Forage quality, analyzing, plate measuring, drones
 - Reduce silage storage losses
- Grazing
 - Improving grazing management
 - New grazing systems
- Other
 - Slurry technologies, agroforestry



Photo: Lilli Frondelius, Luke

Comparing survey with NDA results



Labour was the most highly emphasized in the NDA meetings, which links to a work/life balance which was top of the survey



Salary/returns was in the top three needs in the survey, however was not commonly emphasized in the NDA meetings



Animal welfare scored high in the on-line survey, but was not emphasized in the NDA outputs



R4D approach:



Creating **workplans** by comparing needs and resources by country

EU Countries / NDA in R4D		 Belgium Flanders		 Belgium Wallonia		 Denmark		 Finland		 France		 Germany		 Hungary		 Italy		 Lithuania		 Luxembourg		 Netherlands		 N. Ireland		 Poland		 Rep. Ireland		 Slovenia		 Spain	
Areas number	Areas (WP2 survey)	Needs	Resources available	Needs	Resources available	Needs	Resources available	Needs	Resources available	Needs	Resources available	Needs	Resources available	Needs	Resources available	Needs	Resources available	Needs	Resources available	Needs	Resources available	Needs	Resources available	Needs	Resources available	Needs	Resources available	Needs	Resources available	Needs	Resources available		
1	Dairy cattle management	Orange	Green	Orange	Green	Brown	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Brown	Green
2	Animal nutrition	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Brown	Green	Brown	Green	Orange	Green	Brown	Green	Orange	Green	Brown	Green	Orange	Green	Brown	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green
3	Animal health & fertility	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Brown	Green	Orange	Green	Brown	Green	Orange	Green	Brown	Green	Orange	Green	Brown	Green	Brown	Green	Brown	Green
4	Animal well-being / Welfare	Orange	Green	Orange	Green	Brown	Green	Orange	Green	Orange	Green	Brown	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Brown	Green	Orange	Green
5	Ecological and environmental footprint / Climate change / Inputs efficiency	Brown	Green	Brown	Green	Orange	Green	Brown	Green	Orange	Green	Brown	Green	Orange	Green	Brown	Green	Brown	Green	Brown	Green	Brown	Green	Brown	Green	Brown	Green	Brown	Green	Brown	Green	Orange	Green
6	Society friendly system	Orange	Green	Brown	Green	Brown	Green	Orange	Green	Brown	Green	Orange	Green	Orange	Green	Orange	Green	Brown	Green	Orange	Green	Brown	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green
7	Financial needs / Access to credits	Brown	Green	Orange	Green	Orange	Green	Brown	Green	Orange	Green	Brown	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Brown	Green
8	Business management / Business model / Strategic skills	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Brown	Green	Orange	Green	Brown	Green	Orange	Green	Brown	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green
9	Information sources, Knowledge and Training	Brown	Green	Orange	Green	Brown	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Brown	Green	Orange	Green
10	Labour conditions / farmers' well being	Orange	Green	Brown	Green	Orange	Green	Orange	Green	Brown	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Orange	Green	Brown	Green	Orange	Green	Brown	Green	Orange	Green	Orange	Green

Needs – level of importance:

High	High
Medium	Medium
Low	Low

Resources available

A lot	A lot
Moderately	Moderately
A little / not at all	A little / not at all

Creating **workplans** by comparing needs and resources by country

EU Countries / NDA in R4D		Belgium Flanders		Belgium Wallonia		Denmark		Finland		France		Germany		Hungary		Italy		Lithuania		Luxembourg		Netherlands		N. Ireland		Poland		Rep. Ireland		Slovenia		Spain	
																																	
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Low	

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Matching needs and solutions



- Many challenges: many needs
- Most scored Need and Solution = **Environment/Climate**
- Practical management issues : Lots of resources available
 - Need to exchange, adapt, disseminate, not necessary to create new research
- Lack of practical solutions for farmers: farmers well being

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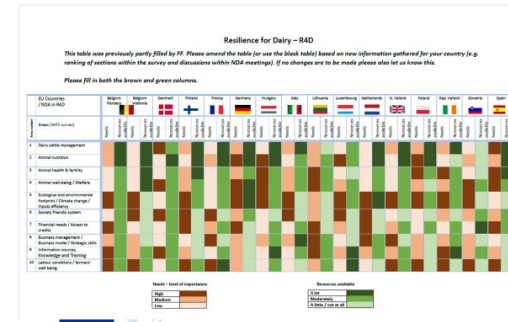
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Subtitles EN

 WATCH THE VIDEO

NDA meetings to select solutions and rank them



NDA meetings Flanders and the Netherlands

NDA meetings Hungary, Denmark and Finland



THE 20 SOLUTIONS SELECTED FOR RANKING IN DK

Rank	Solution
1	Offering milk to collect the eggs, egg bucket or automated feed bucket (instead of bucket or trough) to reduce the risk of abnormal behaviour and prevent the development of crowding
2	High milk allowance (at least 2000-2500 g/day) early in life combined with reduced weaning
3	High milk allowance (at least 2000-2500 g/day) early in life combined with reduced weaning
4	Cross breeding with dairy breeds to improve production, health fertility and longevity
5	Use of good quality and nutritious feed to reduce and increase the value of young stock
6	Strategic feed planning to improve herd health status and longevity
7	Protein feed intake and sufficient growth feed energy from milk or fodder feeds and grains that can replace concentrates
8	Feeds to make business plans to support strategic decisions for dairy farms
9	Early culling of cows leading to culling to improve health, welfare and productivity by preventing lameness and injuries
10	Protein feed intake and sufficient growth feed energy from milk or fodder feeds and grains that can replace concentrates
11	Protein feed intake and sufficient growth feed energy from milk or fodder feeds and grains that can replace concentrates
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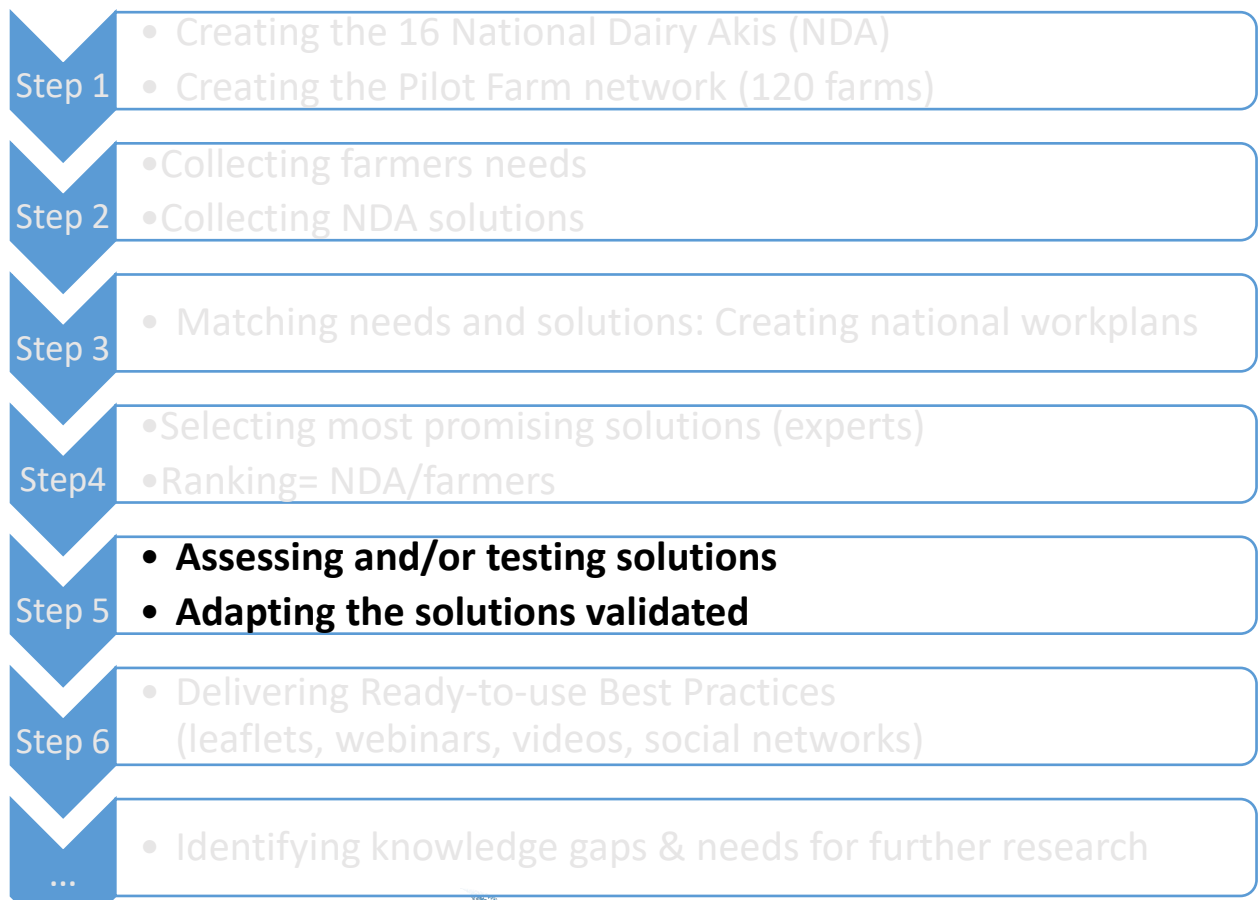
NDA meetings in Germany and Italy



NDA meetings Slovenia and France



R4D approach:



+200 solutions



100 Best Practices

R4D Best Practice: Young stock weight measurement
2019/2020 | video
Dirk and Griet Vandecastelaere keep 110 dairy cows. They have a very efficient young stock management. In order to control the growth of the heifers they measure their weight on a regular basis. This allows them to reach the first calving age at 24 months.
subsidies EN
WATCH THE VIDEO

Methodology of assessments of solutions

- **Farmer needs were collected via survey**

Resulted in 190 “solutions” selected for assessment

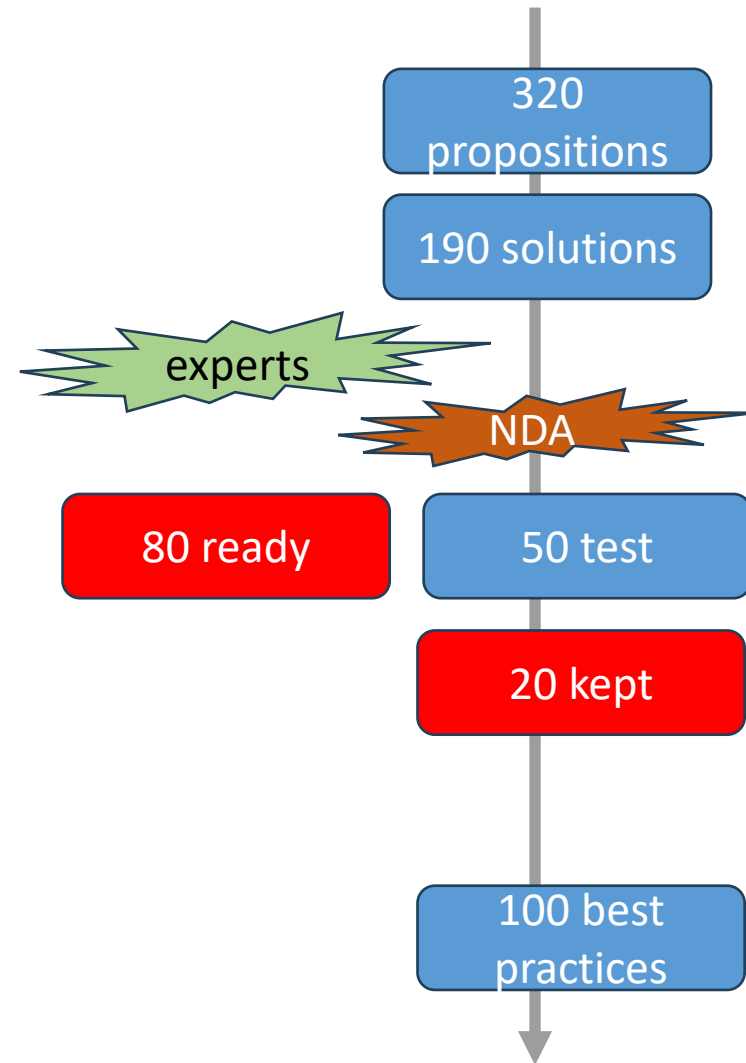
- **Cost / benefit analysis method created**
- **66 expert assessors from 15 European countries**

3329 assessments, thus 50 per assessor

Each solution scored by accessing “not important to very important” (1 to 5)

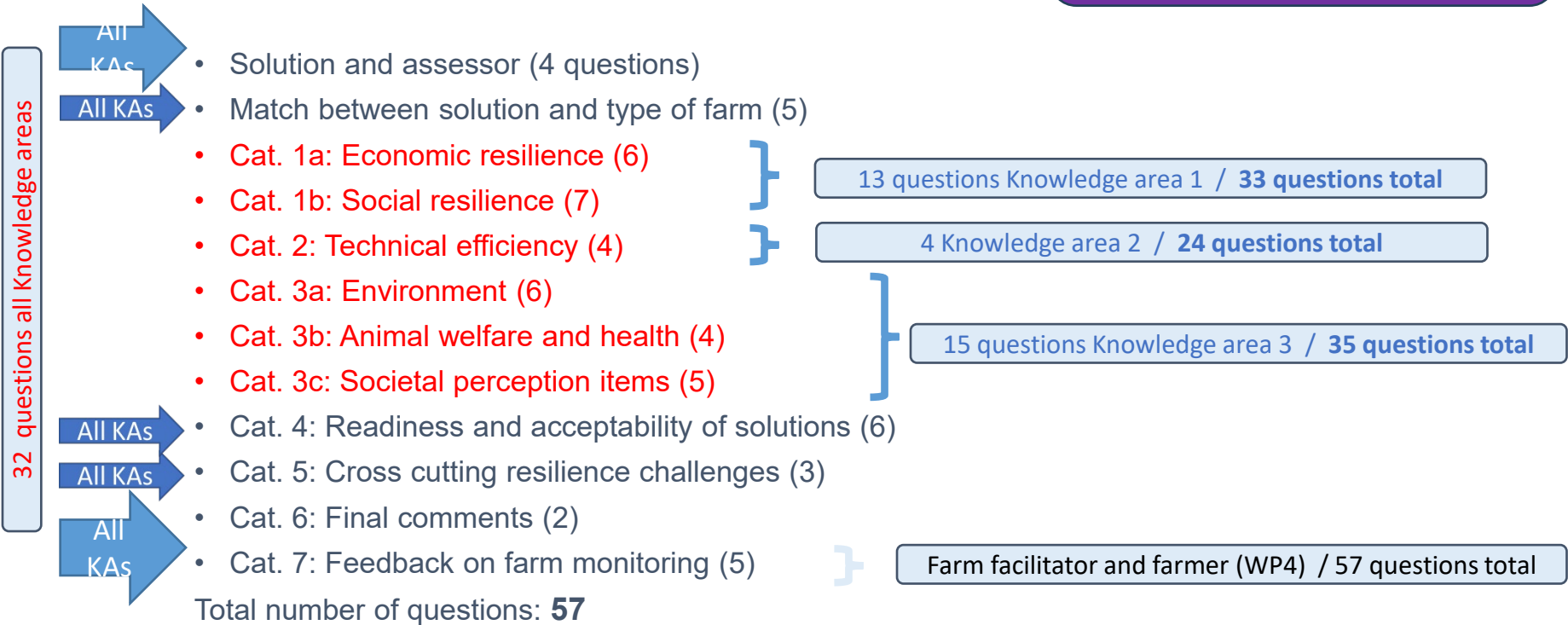
- **2-3 National Dairy AKIS (NDA) meetings in 15 countries to check scored solutions for readiness and acceptability**

20 solutions chosen per country (overlapping)

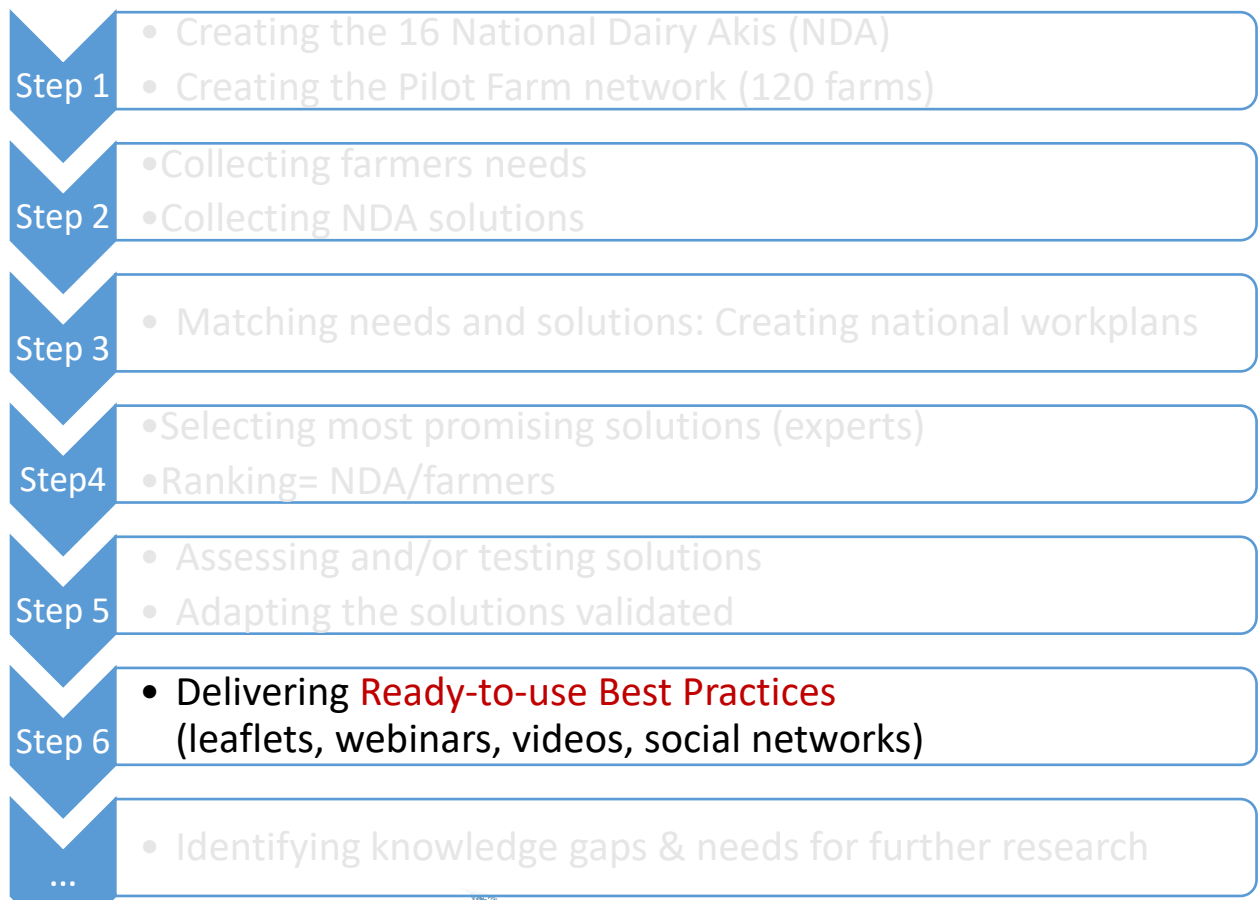


Cost-benefit analysis to assess solutions

Session 60 A. Kuipers et al
This afternoon



R4D approach:



+200 solutions



100 Best Practices

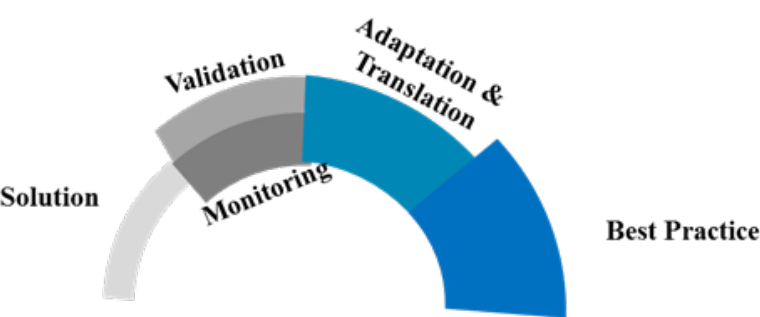


R4D Best Practice: Young stock weight measurement
2020/2021 | Video

Dirk and Griet Vandecastelleers keep 110 dairy cows. They have a very efficient young stock management. In order to control the growth of the heifers they measure their weight on a regular basis. This allows them to reach the first calving age at 24 months. Subsidies EN

[WATCH THE VIDEO](#)

Dissemination of Best Practices





GAEC Trouencon Farm description FR

16.01.2023 | Flyer

GAEC Le Trouencon is using a cross breeding system with pasture.

SHOW THE FLYER



Lameness in dairy cows at pasture - An important challenge for Irish Dairy farmers

14.11.2022 | Webinar

Minimising the incidence of lameness in dairy cows was identified by farmers participating in the Resilience for Dairy project as an important contributor to the resilience of their dairy enterprise. During the webinar the principal types of lameness and solutions in grazing dairy cows are discussed.

WATCH THE WEBINAR

Topic	Topic	Colostrum management: give your calves sufficient colostrum from good quality to become productive cows
Technical efficiency	Economic Resilience	

Background

Calves are born without antibodies in their blood and are totally dependent on antibodies in the colostrum they drink after birth. A good colostrum management is extremely important to rear healthy calves, but also productive cows. However, colostrum management is not optimal at many farms, which has of course a financial impact.

What is a good colostrum management?

Dry period

- Enough dry matter intake (target value (TV): 12 kg DM/day)
- Enough crude protein (TV: 13-14% CP in far-off, 14-15% in close-up)
- Enough vitamins and minerals (Selenium: 31.5 mg/day; vitamin E: 1000 - 1200 units extra in dry period...)
- Enough access to (clean) water (intake: min. 40 L/day)

Colostrum quality

- Milk the cow directly after given birth for a good colostrum quality
- Check the colostrum quality (>2 brix or >5 IgG/L)

Colostrum intake

Give the calf within 6 hours min. 220g IgG (4L colostrum of good quality). However, strive for 300g IgG within 6h!

Storage

- Store colostrum IMMEDIATELY and HYGENIC
 - In the fridge (max. 2 days)
 - In the freezer (max. 1 year)
- Defrost slowly as bain marie or in the fridge. Never heat above 60°C!

Which equipment do you need?

Temperature independent

Digital refractometer

Analog refractometer

Temperature dependent

Colostro balls

Densimeter

Be careful, especially on these points:

- Colostro balls and the densimeter are temperature dependent!
- Do not leave colostrum at room temperature

Specific advices:

- Use a drencher probe if the calf doesn't drink enough
- A colostrum check can be performed to check your colostrum management (contact your vet)
- Use following words:
 - Quick
 - Fresh
 - Much
 - Often

Assessment of method



Positive features:

A good colostrum management leads to less morbidity and mortality, but also to an early first calving age, more productive cows and hence a more resilient farm.

Quote of farmer:

"Good colostrum management leads to healthy and productive cows"

More info:

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N° 101000770.





Automatic Feed Pusher

24.11.2022 | Video

Automatic Feed Pusher help to reduce workload and increase feed intake of dairy cows. This innovative technology is applied on the R4D Pilotfarm Soc. Agr. Cervi Ciboldi in Italy.

WATCH THE VIDEO

In all languages!

www.resilience4dairy.eu



Knowledge areas



KA1
**Economic and
social resilience**

35 factsheets



KA2
**Technical
efficiency**

26 factsheets

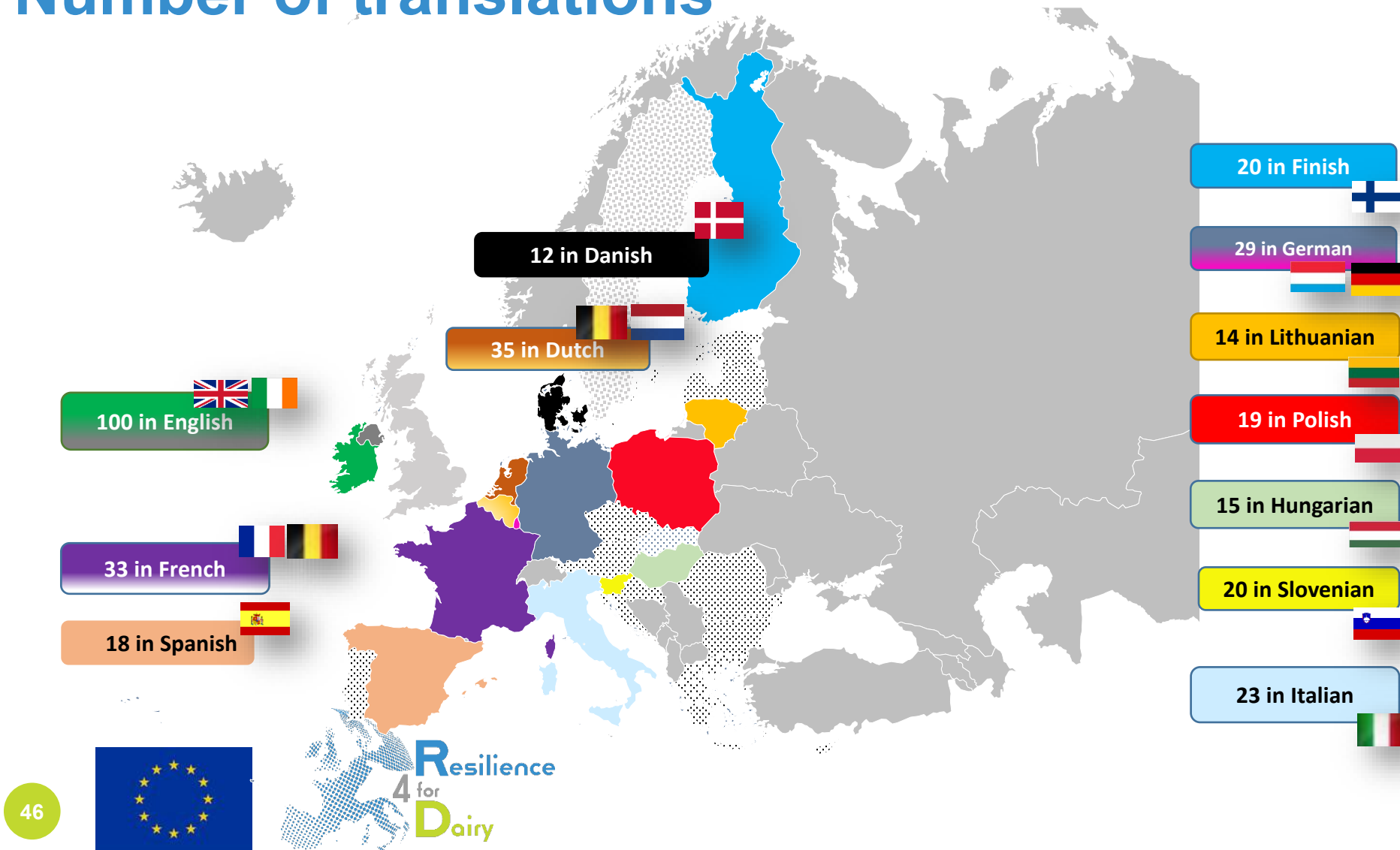


KA3
**Environment,
welfare and society**

39 factsheets

100 factsheets

Number of translations





Needs and solutions

**35
factsheets**

**Work life balance,
salary/returns, flexibility (14)**

**Reliable information sources,
knowledge & training (2)**

**Economic calculators for on
farm decision making (5)**

**Strategic management,
innovative resilience skills (3)**

Career progression (4)

**Added value milk, multi-
purpose farm (7)**



Knowledge areas



KA1
**Economic and
social resilience**

9 videos



KA2
**Technical
efficiency**

24 videos



KA3
**Environment,
welfare and society**

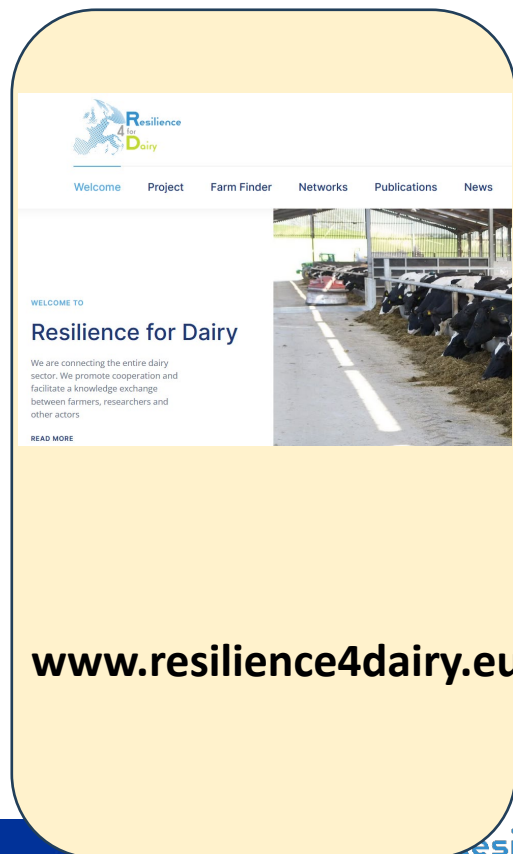
19 videos

52 Videos

Covering 40 different Factsheets

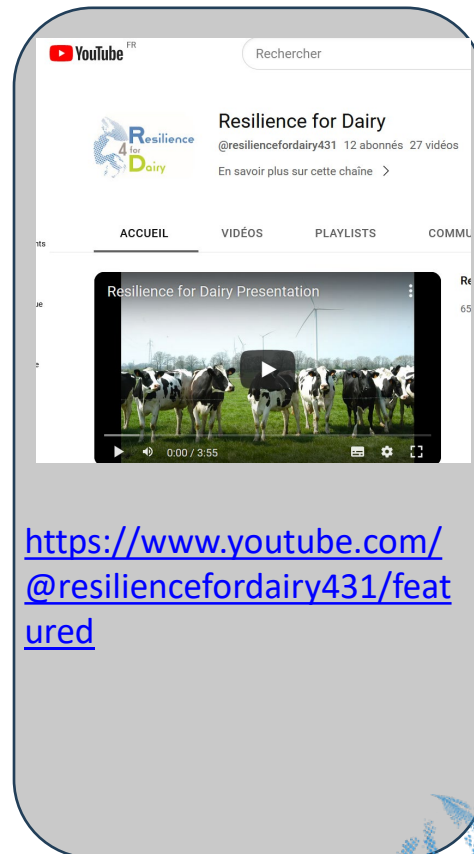
+ 50 webinars + 4 modules of E-learning on Lean

Visit our website



www.resilience4dairy.eu

Visit our Youtube Channel



<https://www.youtube.com/@resiliencefordairy431/featured>

R4D approach:



Resilience for Dairy – R4D

This table was previously partly filled by IF. Please amend the table for use the blank table based on new information gathered for your country (e.g. ranking of actions within the survey and discussion within NDA meetings). If no changes are to be made please also let us know this.

Please fill in both the brown and green columns.

EU Countries (NDA = R4D)	Belgium	France	Germany	Italy	Poland	Portugal	Spain	Sweden	UK	Austria	Denmark	Finland	Greece	Ireland	Latvia	Lithuania	Netherlands	Poland	Portugal	Spain	Sweden	UK	Austria	Denmark	Finland	Greece	Ireland	Latvia	Lithuania	Netherlands
1. Dairy management																														
2. Animal health & fertility																														
3. Animal welfare / Welfare																														
4. Farming and environment (nutrient / climate change / biodiversity)																														
5. Energy needs / Energy use																														
6. Business management / Business model / Management skills																														
7. Information and Training / Knowledge and Training																														
8. Other activities / Other																														

Ready: level of importance

Resilience available



+200 solutions



100 Best Practices



R4D Best Practice: Young stock weight measurement

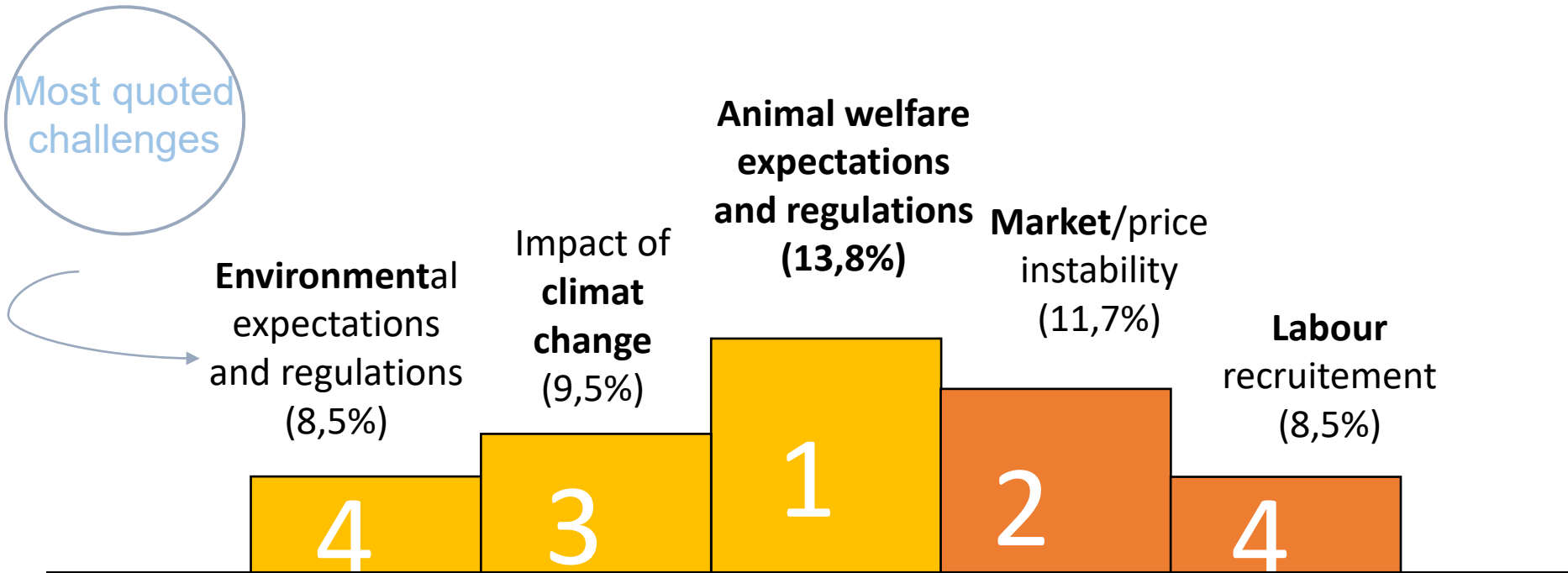
2020/2021 | Video

Dirk and Griet Vandecastelaere keep 110 dairy cows. They have a very efficient young stock management. In order to control the growth of the heifers they measure their weight on a regular basis. This allows them to reach the first calving age at 24 months.

subsidies EN

WATCH THE VIDEO

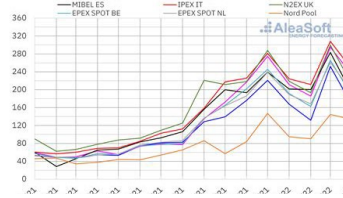
European overview: Main challenges identified in 2022



What changed between 2022 and 2024?

Dry and hot
year

Input prices
(energy,
fertilizer,...)
go up



New CAP



Rainy year

Political
instability



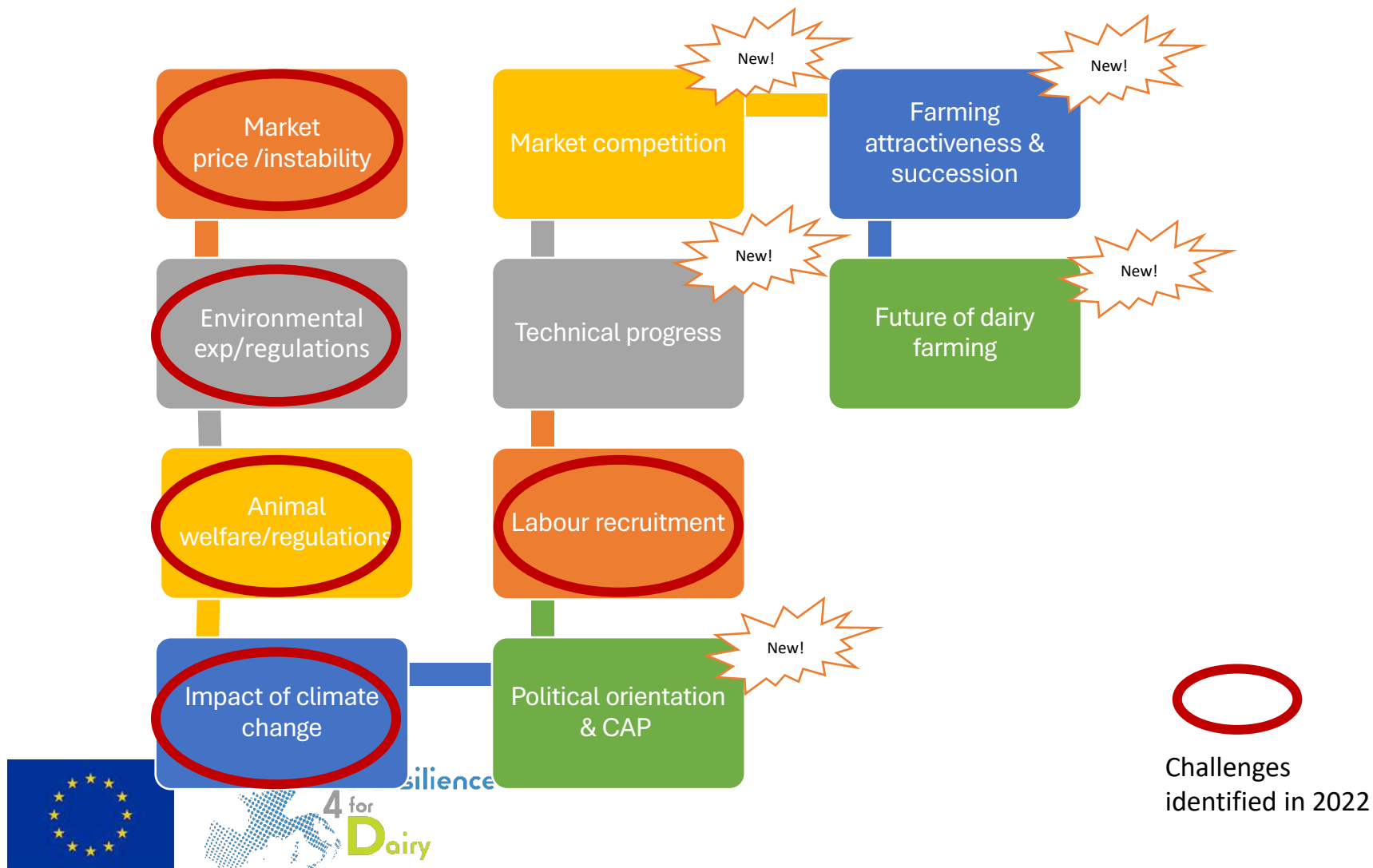
Output
prices go up



Farmers
strike



2024: Are there new challenges?



Missing topics? Topics without answers?

- Consumers / citizen's point of view on dairy system
- Attractiveness / Renewal of generations
- Preparing for EU environmental targets (GHG emissions)



Needs for further research and dissemination

- Need for **practical solutions** to enhance farmers and animal well being, while respecting environment
- Improve communication with citizens



For a more resilient European dairy sector!



A big thank to:

- The 120+ Pilot Farmers
- The 16+ Farm Facilitators
- The 6+ Knowledge facilitators
- All the NDA members from the 16 « countries »
- All the researchers, advisers from the partner organisations
- Our students (Pauline, Alfred, Eva, Stefen, Flore)





Resilience for Dairy (R4D) has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101000770



Thank you for your attention

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Univerza v Ljubljani

