Playing the BovReg Democs Game:
What did people say about cattle breeding?

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The BovReg Democs Game

- Game finalised and printed as boxed sets

- 15 English language games played + 5 pilot games

- Primary purpose **to engage publics** to consider wider issues arising from cattle breeding in group discussion using cards

- Democs is not data collection on public attitudes but can gives valuable insights from groups

- Analysis of the outputs presented in D8.7 Dec.2023

- Not statistically representative of EU population, **samples from groups of people we could reach**

- Extrapolation to wider populations needs much care!

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Cattle Breeding:
what should we do next?

a Democs card game

How we should use our knowledge of genetic
science in breeding cattle for milk and meat?

Game Instructions

This Democs game has been created by
Edinethics Ltd. and the University of Edinburgh
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Democs Game : the Card Types

Story Cards (8) – imaginary people involved in or affected by cattle breeding

everyone has one Story Card and reads it aloud to the group in turn

Information Cards (36): about cattle production, selection, climate change, etc

everyone is dealt a hand, each selects 2, reads them to the group, says why they chose them

Issue Cards (40): ethical and social implications, from different viewpoints

same process as Info Cards, the chosen cards are all laid on the table

As the group discusses, some themes will emerge, maybe agreement, maybe divergence

The dealer encourages the group to write joint statements on Cluster Cards, using the chosen cards

Aim is for group consensus statements, but if opposing views then have a cluster on each

Each player has a Voting Sheet give his/her opinions as an *individual* on questions

about priorities in breeding and about ethics and to give reasons in their own words

Story Cards

- **Genomics researcher** seeking to correlate patterns in cattle genomes with different traits

- **Dairy cattle breeder** deciding on future priorities amongst an ever widening range of traits, which ones should take priority?

- **Alpine farmer using a traditional local breed** but wanting more consistency in the artesanal cheese his family farm makes

- **Climate scientist advising the Government** on how much methane cows emit, explaining the complexity of this controversial issue

- **Environmentalist** advocating pasture-fed extensive cattle farming even if it costs more, but farmers then need financial incentives

- **Vet and her daily problems of cattle diseases** indoors and out, and when to use antibiotics

- Researcher producing **hornless dairy cattle by genome editing**, but what about the ethical issues?

- **Consumer** wanting beef with good welfare and low methane but worried about the price for her family.

Story Card 2

Pieter van Dam
Breeding Co-operative Director

I am the Director of a cattle breeding co-operative. I sell semen from prime breeding stock bulls all over Europe and even wider. In the past we selected mainly for production traits like milk yield, body weight growth or increasing a cow's productive life. Nowadays, with the help of genomic science, the focus has broadened to include a lot more animal health and welfare issues, disease resistance, fertility, and offering animals selected to suit particular environments better. Maybe we will be able to reduce methane emissions in future. But we cannot improve everything. There are always trade-offs. What should be my priorities? And selecting desirable traits in cattle takes a long time. How do I make breeding decisions today which will take 10-20 years to become established in farmers' herds, perhaps in different environments? And who should our co-operative be asking farmers, retailers, consumers, the government?

Cattle Breeding

Story Card 5

Jacques Boucher
Environmentalist

I am worried about the way livestock farming has gone since we started turning animals into super-efficient milk and meat machines, and paid less attention to them as creatures with their own lives. I don't say we should stop having food animals, but I want to get rid of factory farming systems where animals are used as products with no interests of their own. If we must have indoor dairy units, the cows shouldn't be shut in all the time and should have access to grass and outside air. But we should move to more pasture fed cattle, which is better for the animals, helps biodiversity and relies less on buying in additional feed that may add to global warming. Pasture-fed cows grow slower and milk less, but shouldn't we be prepared to pay more for meat and milk that's been humanely and environmentally produced? Farmers should be given incentives for this, and for cows emitting less methane.

Cattle Breeding

Information Cards

Info Card A14

Different types of production system

Cattle are farmed in many different ways such as large, mostly indoor dairy units, medium sized family farms, and small-holdings. Most dairy cattle are Holstein-Friesians. There are many beef breeds and some mixed and minority breeds.

BovReg : Production

Info Card A06

Breeding isn't just about more efficient production

For some years, advanced statistics has enabled more traits to be included than just getting more milk or faster growth. Now new knowledge about cattle genomes will enable more accurate selection for different characteristics.

BovReg : Breeding

Info Card A22

What is animal welfare?

Animal welfare is a balance of many factors of health, well being, mental and emotional aspects. The weighting put on their importance is a matter of ethical values, which will vary among stakeholders and between cultures.

BovReg : Welfare & Health

Issue Cards

Issue Card B04

What are side effects of selecting for higher yields?

Over-selection for increased milk yield means high-yielding dairy cows have short lives, because they became chronically lame or infertile. For some years, breeding goals are seeking a better balance of factors that mean longer productive lives.

BovReg: Breeding

Issue Card B09

Intensive and extensive good or bad?

Some believe intensive animal agricultural systems are too industrial and inhumane, preferring extensive approaches. Others say intensive systems use resources more efficiently, produce less methane, and if well managed can have good animal welfare.

BovReg: Production

Issue Card B28

Slow selective breeding or fast genome editing?

Breeding a desired genetic change into a cattle herd can take many years. If genome editing could make that change quickly, is it the logical next step in breeding? Or would it cross an ethical line - if so why?

BovReg: Genome Editing

Cluster Cards

Statements or questions written by the group from their discussions

	Here are five traits in cattle which could be improved by breeding. How important (or acceptable) are they? (Mark an X in one box in each column)				
	1. Production efficiency	**2. Better disease resistance**	**3. Reduced methane emissions**	**4. Increasing a cow's productive lifetime**	**5. Adapted to different types of environment**
	Improving how efficiently cattle use feed for better growth and milk production	Breeding cows to be more resistant to common diseases. This may also mean giving them less antibiotics.	Breeding for cows that emit less methane, to reduce the agricultural impact of global warming	Selecting dairy cows that have a better fertility, less lameness and good health while having high milk yields	Focusing on factors to make future cattle more adapted to different local and climatic environments
Very important					
Quite important					
Don't know					
A little					
Not important					
Not acceptable					
	Cattle breeders can't give equal weight to *all* traits. How would you rank these traits in order of importance (1 lowest – 5 highest)?				
Ranking :					
If you would like to, say why you made your choices or rankings in your own words					

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Importance of 5 cattle breeding applications

- Production efficiency: improving how efficiently cattle use feed for growth and milk production

- Better disease resistance: breeding cows to be more resistant to common diseases. This may also mean giving them less antibiotics

- Reduced methane emissions: breeding for cows that emit less methane, to reduce the agricultural impact of global warming

- Increasing a cow's productive lifetime. Selecting dairy cows that have a better fertility, less lameness and good health while having high milk yields

- Adapted to different types of environment. Focusing on factors to make future cattle more adapted to different local and climatic environments

Responses on Cattle breeding applications

- High value given to cattle welfare : breeding for benefit of the animal not just humans
- Better disease resistance most frequently cited breeding goal
- Some support for improved productivity if it means using less animals
  and hence less environmental impact *and* provided welfare is respected
- Breeding for reduced methane emissions : complex and nuanced "yes, but …" :
  exaggerated compared with other climate impacts: "too much cow talk"
  or feed changes or less cattle would be more effective
  metabolic changes should not harm the cattle
- Increasing a cow's productive lifetime : some varied viewpoints
  supported if it meant better welfare
  or saw it as expressing more instrumentalisation of cattle : or too far already
- Elite cattle or cattle more adapted to different types of environment? :
  More said adapted, some said elite (less cattle overall), some said do both

Vote B : Cattle Breeding Ethical Questions

6. Moral limits	7. Elite or Robust cattle?	8. Genome editing
Are there moral limits to how far we should adapt cattle by breeding for our own purposes? If so where would you want an ethical line drawn?	Should we aim to breed elite highly productive cattle, which depend on stable conditions, or aim for less efficient cattle more robust to varied situations?	Is it a good idea to use genomic information in cattle to make desirable changes quickly by genome editing, instead of slowly by cross-breeding?

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Vote C : What price are you willing to pay (if any)?
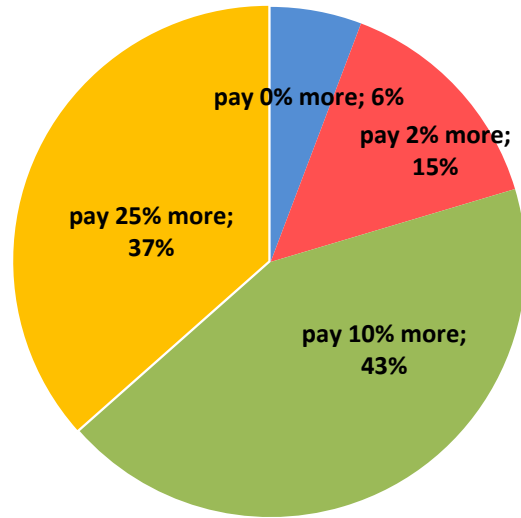
Mark X in one percentage box per question

	How much extra would you be willing to pay for improvements to cattle traits that would make milk or beef more 'ethical', if they also were more expensive?															
	9. With lower cattle methane emissions				**10. Produced from healthier cattle?**				**11. With more disease resistant cattle**				**12. From pasture fed cattle**			
	0	2%	10%	25%	0	2%	10%	25%	0	2%	10%	25%	0	2%	10%	25%
Minced beef																
Steak (a special meal)																
Milk																
A special cheese																

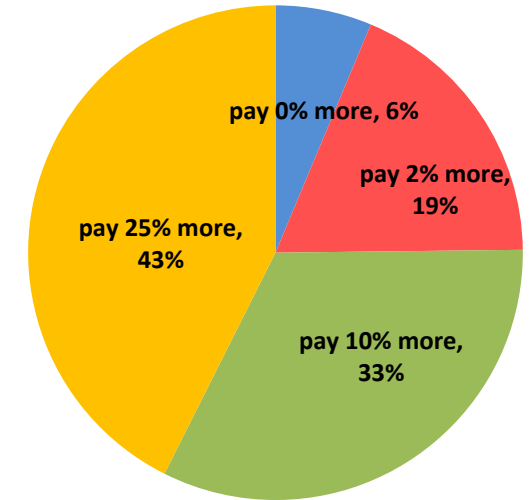# How much more are you willing to pay for Meat or Dairy products?

Over 75% willing to pay 10 or 25% more, except for lower methane cattle

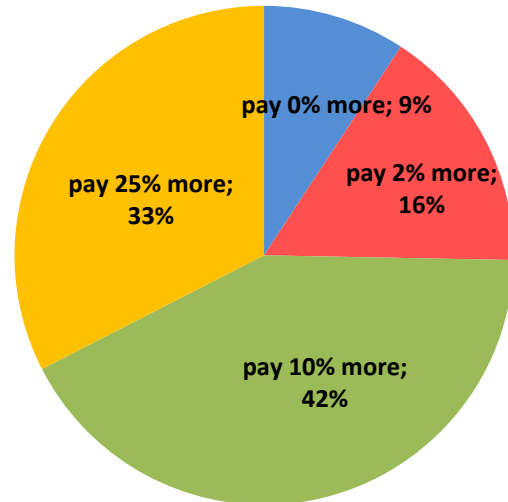**Produced from healthier cattle**

6% were not prepared to pay more for any of these

pay 0% more; 6%
pay 2% more; 15%
pay 25% more; 37%
pay 10% more; 43%

From Pasture Fed cattle

pay 0% more, 6%
pay 2% more, 19%
pay 25% more, 43%
pay 10% more, 33%

From more disease resistant cattle

pay 0% more; 9%
pay 2% more; 16%
pay 25% more; 33%
pay 10% more; 42%

From cattle with : lower methane emissions

Methane : highest not prepared to pay, lowest would pay 10 or 25% more

pay 0% more, 18%
pay 2% more, 21%
pay 25% more, 32%
pay 10% more, 28%

Games played

	No of games	No of people	Countries played in
Pilot games	5	37	NL, Finland
Final games	15	81	UK, Finland, NL
Total	**20**	**118**	

Total games on which we have data so far: 20 games, 118 people played

Gender : slightly more female than male

Spread of ages, but more >60

Mostly well educated, not many scientifically traine

Outputs from the Games played

Main aim of the game : to get groups of people having informed discussions
Secondary aim : to get qualitative data on people's opinions, preferences and insights

Warning : this is **not** *opinion polling !!*
Relatively small number of players
Self-selecting nature of the groups
Data are mainly qualitative
Outputs from these groups cannot simply be extrapolated to wider European publics

But some valuable insights, which indicate questions to explore in more depth
Also to extend to other species