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Broadening the ethical debate on Breeding Innovations, public engagement and the role of the Democcs Game

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Outline

A. The need for ethics

B. Three factors to broadening scope of the debate

- beyond risk and animal welfare
- it should consider not only what is novel
- The importance of public engagement

C. The Democs game



Innovations in genomic selection as a starting point

Genomic selection has become an important tool in livestock breeding, with further potential to widen both the traits and the breeds to which it can be applied.

Example: BovReg project (www.bovreg.eu) on advanced cattle genomics within the FAANG network



The need for ethical reflection

No need!

- In contrast to other reproductive technologies in animal breeding, such as cloning or genome editing, genomic selection has not raised much ethical attention.
- No extensive public debate





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- In contrast to other reproductive technologies in animal breeding, such as cloning or genome editing, genomic selection has not raised much ethical attention.
- No extensive public debate
- The technology is about the use of genome-wide genetic markers to predict the breeding value of selection candidates → it does not cross species boundaries, or require applying new invasive techniques on animals.



The need for ethical reflection

There are ethical issues!

- Unexpected **effects on animal welfare** due to correlations with non-measured traits, a higher risk of spreading deleterious mutations, the centralisation of capabilities and increasing dominance of specific breeds (Mark & Sandøe (2010)).
- Concerns over **increased monopoly** within dairy cattle breeding (idem).
- Link to general need for **good practices** for farm animal breeding (Code-EFABAR 2020).



The need for ethical reflection

There are ethical issues!

- Unexpected **effects on animal** (e.g. correlations with non-measured traits leading to deleterious mutations, dominance and increasing (0)).
- Concerns (idem).
- Link to gen (Code-EFABAR 2020). **good practices** for farm animal breeding

Important but do we need additional reflection on ethics?



Three factors to broaden the debate

1. *Broader ethical scope: **beyond risk** and animal welfare*

- Ethical discussion is often limited to risk and safety.
- Response to legal frameworks and a no-harm principle.
- Minimizing risks to food safety, genetic diversity and economic risks are important

But ethical evaluation of breeding innovations

- should encompass more than this dimension
- Should not be restricted to human-related issues.





Three factors to broaden the debate

1. *Broader ethical scope: beyond risk and **animal welfare***

- There has been attention to the impact of Genomic Selection can have for animals and their welfare
- Important dimension: animal welfare is a core concept in animal ethics

But Focussing ethical and public debates on animal welfare

- may overload the concept, because this invites people to 'translate' their wider concerns into issues of welfare.



Broader scope

Discussion on the ethics of genomic selection can include risk and animal welfare related arguments, but also need to go beyond them. Examples

- justice, autonomy
- 'biopower' i.e. changing animal bodies and populations in a direction dictated by particular human interests (Twine, 2010).
- instrumentalization of animals
- changing power relations among stakeholders
- human-oriented ideas about perfecting animals.



Three factors to broaden the debate

Most of the mentioned concerns are not specific to genomic selection and are relevant in conventional breeding programs or even livestock farming in general.

→ A second factor in broadening the ethical discussion.





Three factors to broaden the debate

2. Beyond what is novel

The ethical analysis tends to focus on what is, ethically speaking, novel about technologies.

Assumption: the situation before the innovation was morally justified or acceptable.

For genomic selection this entail that it should be assessed only by considering whether it introduces novel ethical issues, compared with existing breeding practices.

This view is problematic for two reasons.



Beyond what is novel

1. Adding one element to an existing practice can have far-reaching consequences that expand dimensions that were already present in the existing situation. This may be true for Genomic selection.
2. It fails to reflect on what may be ethically problematic in existing practices. For instance, the assumption that livestock breeding is an uncontroversial practice cannot be taken for granted

We should not limit the ethical reflection on genomic selection to novel issues of the technique only



Three factors to broaden the debate

3. Public engagement

Genomic livestock breeding complex and requires multiple forms of expertise of highly skilled persons and specialised organisations, which tend also to be international.

Discussion is often among experts



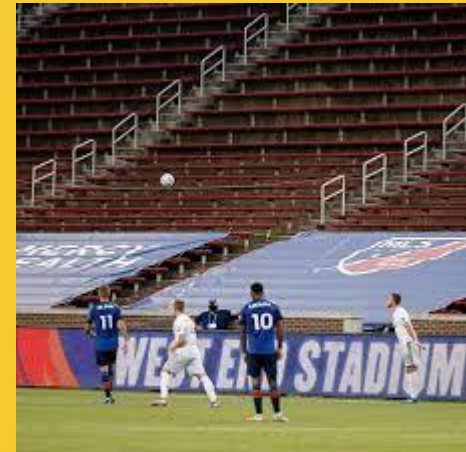


Public Engagement

The general public is seldom consulted/ underrepresented in the literature.

This is problematic because

- public engagement is recognised as an essential element in responsible innovation (Owen et al. 2021).
- Only engaging with technical experts risks limiting the debate to dominant perspectives (Kayumova et al., 2019).





Public Engagement

Two-way public engagement is crucial to invite lay persons to form their own views and enable them to participate in the debate, and to give the general public a voice in making breeding organizations, companies and governance institutions more responsive and accountable.





Democs game

- Integral part of the BovReg project is to conduct public engagement as part of our aim for making responsible innovation.
- Donald Bruce created a Democs card game



Cattle Breeding:
what should we do next?

a Democs game
to discuss how we should use our new
knowledge of genetic science to
breeding cattle for milk and meat



This Democs game has been created by Edinethics Ltd.
as part of the BovReg Project, funded by the European
Commission Horizon 2020 Research Programme



www.bovreg.eu
www.edinethics.co.uk





Democs game

- Aim: stimulate debate among stakeholders, and to give small groups of lay people the opportunity to discuss and express their views about genomic selection in cattle, including ethical questions about breeding priorities/ practices more generally.
- Proven tool for 20 years to enable engagement on technological issues in small groups, assuming no prior knowledge.
- The cards are the 'expert' and provide the basis for group learning and discussion.



Democs game

The cards have been written in a detailed iterative process drawing upon the technical, ethical and Democs game expertise and insights from BovReg partners.

Story cards introduce different aspects of cattle production, genomics and breeding through case studies of imaginary people involved the field or affected by it.

Story Card 7



Hermann Anderegg : Alpine Cattle Farmer



Democs game

Information Cards: provide the context of different approaches of cattle production, with which publics may not be familiar.

Issue Cards: open up relevant ethical and social issues arising from advanced breeding and production, expressing differing standpoints to reflect the range of opinions.

Two outputs: (1) Group opinion statements, written on **Cluster Cards**, based on the cards the group members have chosen to discuss. (2) individual votes by each player on priorities and questions in cattle breeding, with their reasons in their own words.

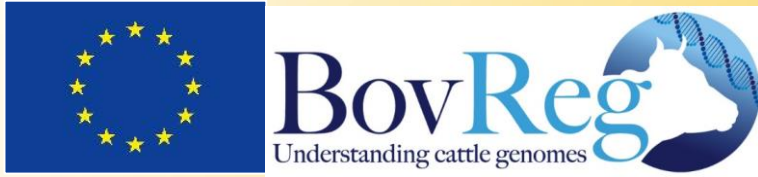


Conclusion

- Breeding innovations raise ethical issues that are not limited to risk and animal welfare, and that go beyond what is novel about such innovations.
- Responsible innovation requires discussing such ethical issues with a wide range of stakeholders, and we invite engagement with those involved in livestock breeding and innovation.
- The Democs game that we have created facilitates the engagement of stakeholders, but especially of lay publics in ethical discussions on genomic selection and cattle breeding.



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www.bovregproject.eu

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