APPENDIX 25

Study on the improved methods for animal-friendly production, in particular on alternatives to the castration of pigs and on alternatives to the dehorning of cattle

D.2.3.2. Proceedings of stakeholder conference: Report of the 'International stakeholder conference: alternatives to the dehorning of cattle

SP2: Alternatives to dehorning: To develop and promote alternatives to the dehorning of cattle.

WP2.3: Short and long term strategies for future development.

Due date of deliverable: October 09

Actual submission date: October 09

Final

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Isabelle Veissier (INRA)

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1 Introduction

The objectives of subproject 2 of ALCASDE were to make a survey of the situation regarding dehorning in the Member States, to summarise information on the possible effects of dehorning on the development of the animals and to look for strategies to promote the development of alternatives to the dehorning. However, there were also objectives of the project to create a participatory framework allowing meaningful dialogue between the partners and the stakeholders to ensure that the project meets the needs of the end users and to gain advice and feedback from the stakeholders to assist in the development of the research and dissemination process. In consequence, the present workshop was designed with the following objectives.

Objectives:

- To present findings about the estimation of how many cattle are dehorned or not, and how dehorning is practiced across the European Union
- To present findings about farmers' attitudes towards dehorning practices vs. horned animals
- To present findings about the assessment of pros and cons of current alternatives to dehorning, such as keeping fully horned animals and producing polled animals
- To present the e-learning material developed in the project to the stakeholders to receive their feedback
- To use the findings and experiences from veterinarians, producers and breeders, the meat industry and NGO's to discuss with stakeholders common short and long-term concerns, solutions and recommendations.
- To deliver proceedings of the stakeholder conference

2 Summary of the workshop (Chair: Antoni Dalmau, IRTA)

Frequency of dehorning in the Member States and Farmers' attitudes and expectation

Keeping hornless adult cattle (dairy or suckler) is the most frequent situation in the EU Member States.

Disbudding with hot iron by the farmer and without the use of a pain releaser is the most frequent practice.

Training and guides of good practice are not very frequent and farmers are not always aware of specific regulation or possibilities to use pain releasers and there is some interest in having more information.

Reducing the risk and the severity of injuries for the farmers and for the animals is the main reason for disbudding and dehorning while ethical reasons are a main motivation not to dehorn.

The choice to keep horned or hornless cattle are exclusive choices and has direct implications on housing and management practices.

Disbudding is preferred in comparison to dehorning by farmer as a less stresfull and painfull procedure for the animal.

Using polled cattle will be an alternative to dehorning for farmers if bulls of high genetic quality are available but freedom of choice between different alternatives remain one of the main expectation of farmers.

Welfare implications of dehorning

Both disbudding and dehorning induce tissue damages and produce physiological and behavioral reactions that indicate pain.

Disbudding induce less negative welfare consequences than dehorning.

For disbudding, the use of a hot iron appears to be preferable.

Local anesthetics reduce pain during disbudding/dehorning and non-steroidal anti-inflammatory drugs reduce pain during the following hours.

Sedation allows an easier handling of the animals and an easier administration of local anesthetic but interfere with the monitoring of anesthesia.

There is a lack of knowledge about possible long term pain after disbudding/dehorning.

Alternatives to the dehorning

Polled cattle

The most relevant gene to control hornless phenotype, the polled gene, has two alleles with the Polled (P) one dominant.

The presence of polledness depends on the breed with some main beef breeds being completely polled but in most main breeds only a few number of heterozygous bulls are available. Many problems still need to be solved as low breeding values, presence of Scur alleles or negative traits.

Classical introgression program takes 20 years and there is still a gap in genetic merit between horned and dehorned animals. To reduce the loss of genetic merit of polled animals and the time needed for introducing the polled gene, genomic selection seems a promising method. Then, in the main breeds, it can be hypothesized that sufficient polled bulls with a high value can be obtained in approximately ten years.

The future of polled cattle is hard to predict. It will mainly depend on the acceptability by citizens, efforts made by the main breeding companies and availability of high breeding value bull for farmers.

Keeping horned cattle

As dehorning in loose housing system is largely predominant, few recommendation and information are available for farmers who want to keep horned cattle and further research is needed in order to improve existing recommendations.

Keeping horned cattle can induce economic losses in combination with higher investment costs and farmers need additional support.

As keeping horned cattle and keeping polled cattle are the two alternatives to dehorning, future policy should take into account the benefits and disadvantages of both options so that they both remain viable.

The stakeholder views

In general, vets, producers and the meat industry are against the use of only horned animals due to management and economic reasons.

Horned animals make more difficult and dangerous to handle cattle in a yoke (vets), management in a farm (producers) and during transport or at the arrival to the slaughterhouse (meat industry)

One of the concerns highlighted by different stakeholders (vets, producers and meat industry) are the problems that occur in a group when some animals are horned and others not.

Some stakeholders (producers and meat industry) stated that if changes are encouraged, the economic investments in facilities and needs of space must be considered. In contrast, NGO's stated that disbudding in the right way is very costly in personnel and time, and these expenses can be reduced by using horned animals.

In general, the different stakeholders agreed in doing disbudding and not dehorning, although sometimes dehorning cannot be avoided.

In general, for disbudding, hot iron is preferred to caustic paste, although further research is needed to study the effects of caustic paste in a long term.

There was a general agreement in doing disbudding/dehorning only with anaesthesia + NSAIDS

There is a tendency to have more and more polled bulls in different breeds, but there is a concern about their quality and problems of inbreeding.

Polled animals are not well seen by NGO´s if they come from genetic manipulation.

It is necessary to give good information to the producers and to develop protocols to carry out disbudding with training courses for farmers.

The use of local anaesthesia and analgesics by farmers is not allowed in some countries, so, that needs to be harmonized in the EU.

The question of horned and dehorned goats must be also considered. In this species polled animals, by the moment, is not an alternative.

3 Symposium programme

The programme of the 'International stakeholder conference: alternatives to the dehorning of cattle' was:

Programme

11:00	Welcome (Maria Angels Oliver, IRTA)
11:05	Alternative to dehorning: a DG SANCO initiative (Jostein Dragset, EU-Commision - DG-SANCO)
11:20	ALCASDE project and Subproject 2: Alternatives to the Dehorning (Luc Mirabito- IE)
11:30	Description to the survey of current dehorning practices (Giulio Cozzi, UNIPD)
11:50	Attitudes of farmers towards dehorning (Florence Kling-Eveillard, IE)
12:10	Keeping horned cattle: benefits and drawbacks (Ute Knierim, UKA)
12:30	Selection and keeping of polled cattle (Jack Windig, ASG)
12:50	Demonstration of the e-learning (Cledwyn Thomas, EAAP)
13:10	Lunch
14:00	The stakeholder approach: Expectation and proposal to improve animal welfare in relation with dehorning: a) Veterinaries: NickBlayney (Federation of Veterinarians of Europe) b) Producers and breeders: Xavier David (UNCEIA) c) Meat industry: Flemming Thune-Stephensen (UECBV) d) NGO's: Peter Stevenson (Eurogroup for animals/CIWF)
15:30	Further development to alternatives to dehorning (Susanne Waiblinger, WUW)
16:00	General discussion (Chair: Isabelle Veissier, INRA)
17:30	Conclusions and recommendations (Chair: Luc Mirabito, Subproject leader, IE)
18:00	End of the meeting

4 Slide presentation by (Jostein Dragset, EU-Commision - DG-SANCO): Alternative to dehorning: a DG SANCO initiative.

Directorate-General for Health & Consumers

Alternative to dehorning: A DG SANCO initiative

ALCASDE
International Stakeholder Conference
Bologna October 28, 2009

Jostein Dragset
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The views expressed may not in any circumstances be regarded as stating an official position of the European Commission

Directorate-General for Health & Consumers

Animal Welfare in 2009: still an expanding policy area

- **Animal welfare policies in the EU are today an issue of high public concern and political relevance.**
- **The critical link between animal welfare, animal health and food safety has been widely assessed.**
- **Animal welfare is no longer considered a *"sentimental issue"***

Directorate-General for Health & Consumers

Background for the study

- Dehorning has been an accepted part of cattle management
- EFSA opinions conclude that dehorning can have acute severe effect on animal welfare
- Greater awareness of animal welfare in recent years calls for reflection about current methods
- A budgetary initiative from the European Parliament
- Support future Commission initiatives
- In line with the Community Action Plan on Animal Welfare 2006-2010

Directorate-General for Health & Consumers

The Community AW Action Plan: 2006 - 2010

- **Communication from the Commission to the European Parliament and the Council that proposes five main areas of action**
- **Outlines a range of actions for the period 2006-2010 covering not only farm animals, also laboratory and wild animals**

Directorate-General for Health & Consumers

The five main areas of action

1. **Upgrading existing minimum standards for animal protection and welfare**
2. Giving a high priority to promoting policy-orientated future research on animal protection and welfare and application of the 3Rs principle
3. Introducing standardised animal welfare indicators
4. Ensuring that animal keepers/ handlers as well as the general public are more involved and informed on current standards of animal protection and welfare
5. Continue to support and initiate further international initiatives to raise awareness and create a greater consensus on animal welfare

Directorate-General for Health & Consumers

DG SANCO responsibilities

- Follow up of the scientific opinions
  - European Food Safety Authority
  - Specific studies (Welfare Quality, ALCASDE)
- Preparation of the legislative proposals for the protection of farmed animals
  - Impact Assessment – Socio-economic studies
- Verification of the implementation of EU standards by the Member States
  - Food and Veterinary Office
  - Legal Unit for infringement proceedings

Directorate-General for Health & Consumers

Policy making ingredients

Common market harmonisation

Minimum standards

NGO reports,

Member States reports,

FVO inspections

Stakeholders
Public concern

Socio-economics

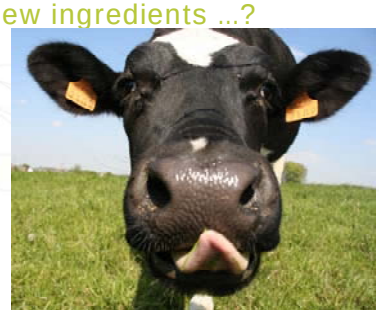
Scientific evidence

European Food Safety Authority

Welfare Quality - ALCASDE

Directorate-General for Health & Consumers

New ingredients ...?



Key points:

1- The animal welfare unit of DG-Sanco was created in April 2008.

2- Animal welfare in 2009: still an expanding policy area

→ animal welfare per se

→ links animal welfare, health and food safety

→ links animal welfare and sustainability

= animal welfare is no longer considered as a ‘sentimental issue’

3- dehorning of cattle is a common practice, although it is painful (EFSA reports 2001, calves 2006, cows 2009). Consumers ask for more information (eurobarometers) → Report from DG-Sanco on labelling and European Network of Reference Centres (should be adopted 28Oct2009)

European parliament granted money for studies on alternatives to castration on piglets and dehorning of cattle, in line with the current Community action plan on animal welfare 2006-2010

4- The Community action plan 2006-2010. Including upgrading minimum standards, especially in areas not covered by existing legislation. Dehorning and castration are such areas.

Will we always upgrade standard or shall we set legal minimums?

Players: commission and EU, but also other players

Are laws to only way to achieve goals? Or encouraging stakeholders to put in place voluntary programmes, training of animal keepers, labelling (for consumers to be able to choose welfare product), coordinating research (eg ERC).

5- Current legislation on dehorning of cattle

Council directive 1998/58/EC general issues

Council of Europe (eg may be necessary to consider dehorning only before 8 weeks)

Last sentence: *Animal welfare is a value for all society and for the animals*

5 Slide presentation by Luc Mirabito (Subproject leader, IE): 'ALCASDE project and Subproject 2: Alternatives to the dehorning of cattle'.

Call for tender and main objectives

DG SANCO 2008/D5/018

Study on the improved methods for animal-friendly production, in particular on alternatives to the castration of pigs and on alternatives to the dehorning of cattle
ALCASDE
Sub-project 2 : Alternatives to dehorning

- ✓ Survey of today's situation regarding dehorning in the Member States
- ✓ Assessment of the existing alternatives
- ✓ information on the possible effects of dehorning on the development of the animals
- ✓ Development and strategies to promote further alternatives to the dehorning

Bologna, 28/10/2009 ALCASDE Alternatives to Castration and Dehorning

Bologna, 28/10/2009 ALCASDE Alternatives to Castration and Dehorning

Alcasde sub project : « Alternatives to the dehorning »

- ✓ A pilot study
- ✓ « State of art »
- ✓ How to develop and promote improvements ?

Please notice that …

- ✓ Preliminary results
- ✓ All is confidential

Bologna, 28/10/2009 ALCASDE Alternatives to Castration and Dehorning

Bologna, 28/10/2009 ALCASDE Alternatives to Castration and Dehorning

State of the art of dehorning in the Member States

- ✓ Quantitative survey of current dehorning practices
  - × How many cows are dehorned in Europe? What is the proportion of each technic (age? Tools ? Use of pain releasers?)
  - × Dairy cows, suckler herd, beef
- ✓ Analyse of attitudes of farmers toward dehorning
  - × Qualitative survey : why do farmers dehorn or not ? What are the problems encountered ? What are their expectations ?
  - × France, Germany, Italy (3 focus group per each country)

Assesment of benefits and drawback of dehorning and alternatives to dehorning in dairy and beef cattle

- ✓ Benefits and drawbacks of the rearing of horned cattle compared to dehorned cattle
  - × Disbudding or dehorning – reasons, methods
  - × Stress- and pain alleviation during disbudding or dehorning
  - × Significance of horns for cattle and long-term impact of dehorning
  - × Potential effects of horns or absence of horns on metabolism, digestion, sensory inputs, immune system, vitality, fertility and milk quality
  - × Requirements for the keeping of fully horned cattle
- ✓ Benefits and drawbacks of the selection and rearing of polled animal
  - × Polled gene, description and location
  - × Occurrence of polled gene in different breeds
  - × Breeding program, opportunities offered by genomic

Bologna, 28/10/2009 ALCASDE Alternatives to Castration and Dehorning

Bologna, 28/10/2009 ALCASDE Alternatives to Castration and Dehorning

Short term and long term strategy for future development

- ✓ Further development of alternatives to dehorning
  - × Practical recommendation at farm level for keeping horned cattle
  - × E Learning
- ✓ Stakeholders' conference

Alternatives to the Dehorning of cattle

- ✓ 3 steps
  - × Description of work carried out in the project
  - × Expectation and proposal to improve animal welfare in relation with dehorning
  - × Discussion on strategies to develop and promote alternatives
- ✓ Some first discussion points
  - × Promoting good practice
  - × Diffusion "Polled" gene
  - × Rearing horned cattle
  - × …

Bologna, 28/10/2009 ALCASDE Alternatives to Castration and Dehorning

Bologna, 28/10/2009 ALCASDE Alternatives to Castration and Dehorning

Key points:

Objectives of Alcasde: a survey of the today situation, assess existing alternatives, development of strategies

Workshop: presentation of results from Alcasde, presentation of stakeholders point of view, discussion

6 Slide presentation by Giulio Cozzi (UNIPD): 'Description to the survey of current dehorning practices'.

WP 2.1 State of art of dehorning in the Member States
Overview of the quantitative survey

Giulio Cozzi

Department of Animal Sciences
University of Padova

ALCASDE
Alternatives to Castration and Dehorning

Main aims of the survey

To have a better understanding across EU about:

- How many cattle are dehorned
- The methods of dehorning
- Who is carrying out the procedure
- The use of drugs during the procedure
- The reasons why farmers dehorn their cattle

Methodological approach - 1

- Specific questionnaires for dairy, beef and suckler hers
- Local contacts in each Member States
- Submission of the questionnaires to National experts (breeders' & farmers' associations, governmental and academic researchers, veterinary practitioners, etc.)
- Quantitative analysis to produce figures at national, EU level and in four macro-regions

Methodological approach - 2

Macro-region	Countries
North	Finland, Sweden, Denmark, Latvia, Lithuania, Estonia, Ireland, United Kingdom
Centre	Germany, France, Belgium/Luxemburg, Netherlands, Czeck Republic, Slovakia, Austria.
East	Poland, Bulgaria,, Hungary, Romania, Slovenia
South	Cyprus, Greece, Italy, Portugal, Spain

Methodological approach - 3

Basic assumptions:

- **Disbudding =** as removal of the horn buds in calves ≤ 2 months of age.
- **Dehorning =** as removal of the horns of a more aged animal, up to 1-2 years or more.
- **For a given cattle category, results for Europe and the four macro-regions have been calculated by weighing the data from each Member State for the number of animals reared in the same Country according to EUROSTAT 2007.**

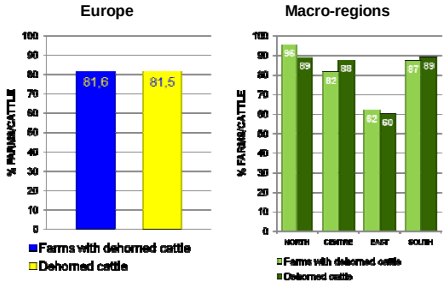
Results – National reports

MACRO-REGION	COUNTRY	National report: Dairy	Beef	Suckler herds
NORTH	Denmark	x	x	x
	Estonia	x	x	x
	Finland	x	x	x
	Ireland	x	x	x
	Latvia			
	Lithuania			
	Sweden	x		x
	United Kingdom	x	x	x
CENTRE	Austria	x	x	x
	Belgium/Luxemburg			
	Czech Republic	x		
	France	x	x	x
	Germany	x	x	x
	Netherlands	x	x	x
	Slovakia			
EAST	Bulgaria	x	x	x
	Hungary	x	x	x
	Poland	x	x	x
	Romania	x	x	x
	Slovenia	x		x
SOUTH	Cyprus	x		
	Greece	x	x	x
	Italy	x	x	x
	Portugal	x	x	x
	Spain	x	x	x

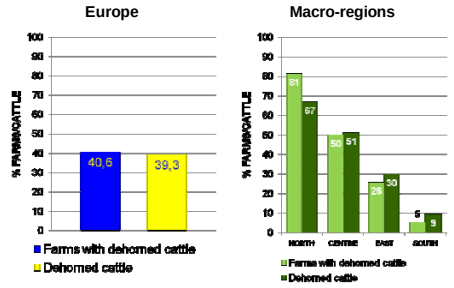
	Questionnaires
Dairy	484
Beef	109
Suckler herds	133

How many cattle are dehorned?

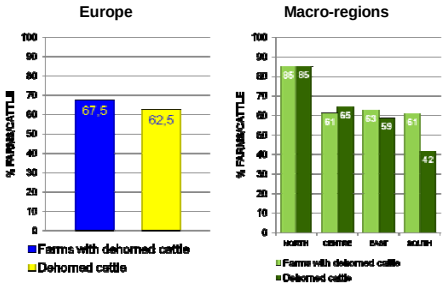
Cattle dehorning in Europe – Dairy herds



Cattle dehorning in Europe – Beef cattle



Cattle dehorning in Europe – Suckler herds

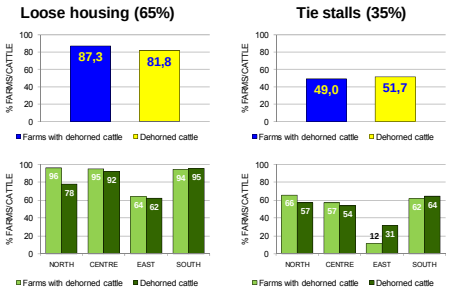


Polled cattle in Europe and in macro-regions (%)

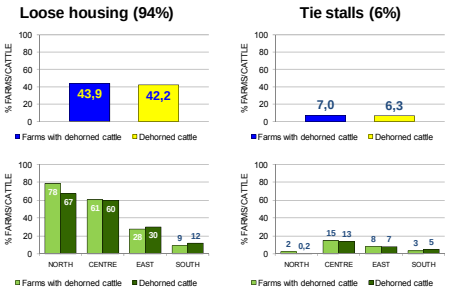
	Dairy herds		Beef cattle		Suckler herds	
	Farms with polled cattle	Polled cattle	Farms with polled cattle	Polled cattle	Farms with polled cattle	Polled cattle
Europe	**0.9**	**0.9**	**7.8**	**3.2**	**7.2**	**7.7**
North	1.2	1.0	26.3	7.3	10.0	16.1
Centre	1.1	1.2	0.9	0.2	3.5	5.6
East	0.3	0.5	3.1	3.5	15.2	8.9
South	0.6	0.6	1.1	1.8	0.3	0.3

Dehorning and housing system

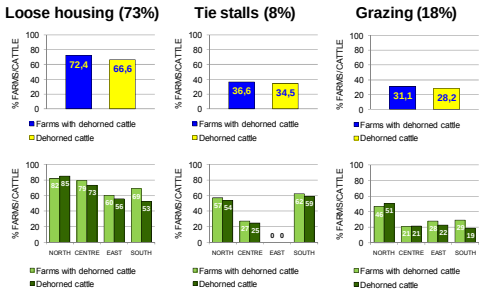
Housing system and cattle dehorning – Dairy herds



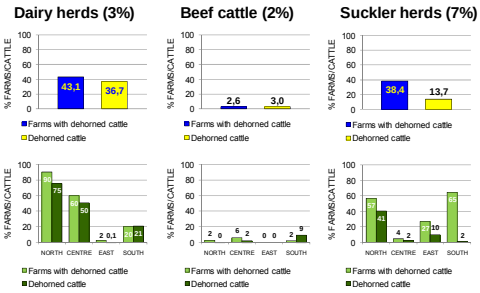
Housing system and cattle dehorning – Beef cattle



Housing system and cattle dehorning – Suckler herds

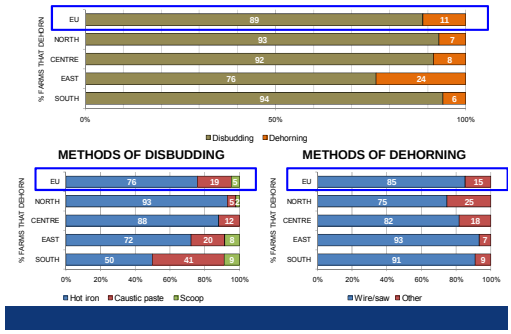


Production system and cattle dehorning - Organic

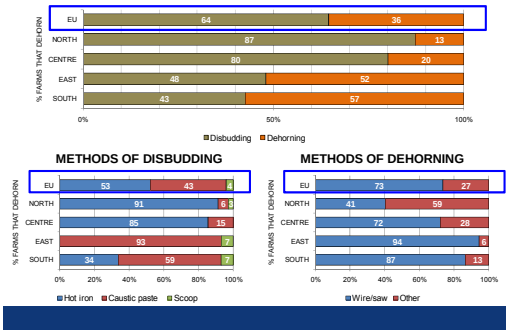


The methods of dehorning

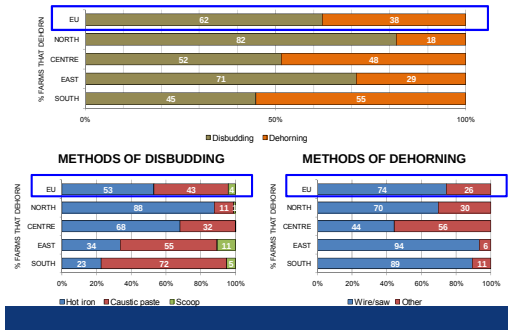
Disbudding vs. dehorning - Dairy herds



Disbudding vs. dehorning – Beef cattle



Disbudding vs. dehorning – Suckler herds



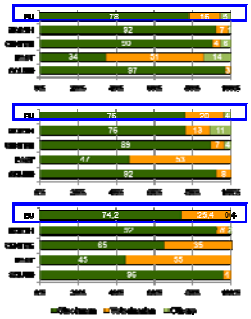
Who is carrying out the procedure?

Person carrying out the procedure – Disbudding (%)

Dairy cattle (89%)

Beef cattle (64%)

Suckler herds (62%)

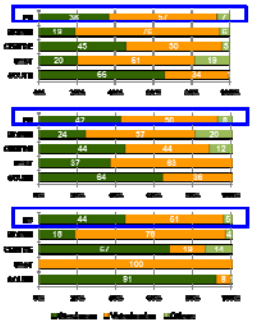


Person carrying out the procedure – Dehorning (%)

Dairy cattle (11%)

Beef cattle (36%)

Suckler herds (38%)



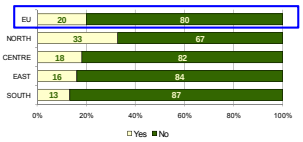
The use of drugs during the procedure

Use of drugs during the procedure – Dairy farms (%)

DISBUDDING (89%)

If yes (% of farms):

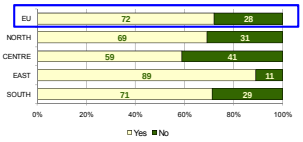
Sedation (SED)	18.2
Local Anaesthesia (LA)	54.1
Analgesia (AG)	4.0
SED+LA	14.2
SED+AG	2.5
LA+AG	0.8
SED+LA+AG:	6.2



DEHORNING (11%)

If yes (% of farms):

Sedation (SED)	34.5
Local Anaesthesia (LA)	35.0
Analgesia (AG)	1.7
SED+LA	17.9
SED+AG	0.7
LA+AG	0.7
SED+LA+AG:	9.4

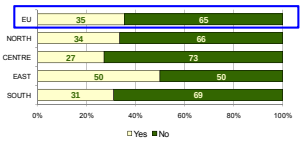


Use of drugs during the procedure – Beef farms (%)

DISBUDDING (64%)

If yes (% of farms):

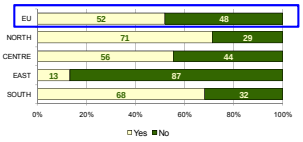
Sedation (SED)	11.7
Local Anaesthesia (LA)	58.2
Analgesia (AG)	6.0
SED+LA	17.0
SED+AG	2.7
LA+AG	1.0
SED+LA+AG:	3.4



DEHORNING (36%)

If yes (% of farms):

Sedation (SED)	6.8
Local Anaesthesia (LA)	33.6
Analgesia (AG)	11.3
SED+LA	25.1
SED+AG	14.9
LA+AG	0.9
SED+LA+AG:	7.5

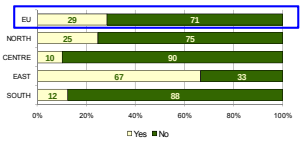


Use of drugs during the procedure – Suckler farms (%)

DISBUDDING (62%)

If yes (% of farms):

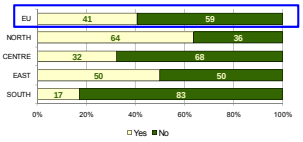
Sedation (SED)	17.0
Local Anaesthesia (LA)	51.5
Analgesia (AG)	2.1
SED+LA	24.6
SED+AG	1.0
LA+AG	1.5
SED+LA+AG:	2.3



DEHORNING (38%)

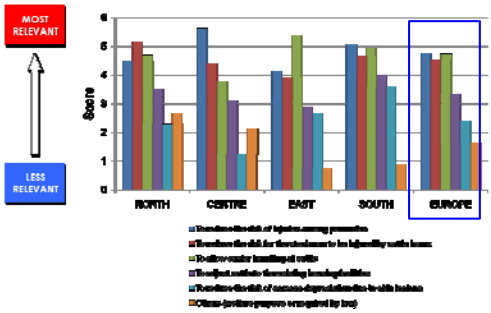
If yes (% of farms):

Sedation (SED)	8.8
Local Anaesthesia (LA)	62.0
Analgesia (AG)	2.2
SED+LA	14.3
SED+AG	5.7
LA+AG	2.3
SED+LA+AG:	4.8



Why farmers dehorn their cattle?

Reasons why farmers dehorned cattle



General conclusions

- In Europe, about 81% of dairy, 41% of beef and 68% of suckler herds farms are currently dehorning their cattle and the percentage of dehorned animals is the highest in the North macro-region.
- The overall prevalence of polled cattle is very low, particularly in the dairy cattle population (<1%).
- Dehorning is performed primarily in conventional farms on cattle housed in free stall systems in order to reduce the risk of injures for the stockman and among the pen-mates as well as to allow an easier cattle handling.

General conclusions

- As a method of horns removal, disbudding is generally preferred over dehorning and hot iron is the most used method especially in the North and Centre macro-regions. The use of caustic paste appears more frequent in the South and the East.
- Dehorning of more aged cattle is mainly performed with the wire/saw method while alternative methods and instruments (guillotine, sheers, grinders etc) have been reported only in specific Countries.
- The stockman is the main person in charge of calves disbudding. Horns removal from more aged cattle is performed with a frequent use of drugs and therefore it is more consistently carried out by veterinary practitioners, often with the assistance of the stockman.

ALCASDE
Alternatives to Castration and Dehorning

Key points:

Subtask 2.1.1 Survey

1. Dehorning:

1.1 Dairy cattle : 81.5 cattle are dehorned in Europe. Less dehorned cattle in eastern Europe (small farms)

1.2 Suckler cows: around 65 % dehorned

1.3 Fattening cattle: around 40% dehorned cattle. More in North > Centre > East > South

2. Polled animals: Dairy cows 0.9 %; Fattening cattle 3.2%; Suckler cows 7.2 %
3. Dehorning in farm is more frequent in loose housing than in tie housing
4. In organic: dehorning is not banned. Only 40% dairy cows and 14% in suckler cows are dehorned. Very few animals dehorned in fattening cattle.
5. Methods

90% of the cases are disbudded, especially with hot iron. East and South of Europe: more caustic paste.

Dehorning is practiced in case of injured animals or to brought in some animals (in a herd of dehorned animals)

6. Who is dehorning?

Disbudding: Generally the farmer. In eastern Europe, vets may dehorn more often

Dehorning is generally carried out by vets

7. Use of drugs

Dairy: very little use of drugs, large variation of what is used (sedation, anaesthesia, antalgesia…) → it doesn't exist fixed protocols.

In the case of dehorning the use of drugs are higher, but, generally, they are used not for the animals but for work safety!

8. Reason for dehorning: To adapt animals to housing conditions

7 Slide presentation by Florence Kling-Eveillard (IE): 'Attitudes of farmers towards dehorning'.

ALCASDE
Alternatives to Castration and Dehorning

State of the art of dehorning
Analysis of attitudes of farmers towards dehorning (task 2.1.2)

Florence Kling-Eveillard (Institut de l'Elevage, France)
Nora Irrgang, Ute Knierim (University of Kassel, Germany)
Flaviana Gottardo, Rebecca Ricci (University of Padova, Italy)
Anne-Charlotte Dockès (Institut de l'Elevage, France)

Bologna 28 October 2009

Objectives

- **to get a better understanding of the reasons why** farmers rear animals with or without horns, how they manage them
- **to get knowledge about the farmers' representations of** the different disbudding and dehorning **methods**, of **animal pain** and of the different methods to reduce pain
- **to have an idea of their willingness to change their practices** / to modify their disbudding or dehorning practices / to stop or begin disbudding or dehorning / to use polled cattle

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Method

- 9 focus groups : 3 per country (Italy, Germany, France)
- A common interview guide
- Common criteria to choose the participants of each group
- A common template for the analysis (report and tables)

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The focus group method

- A small group (approx.8 to 12)
- Sharing a common experience or identity
- To analyse the common values, representations, norms, practices and views

→ 94 participants, March to June 2009
→ A significant diversity of characteristics and views

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The Italian focus groups

- I1 : Trentino, dairy farmers, mountain area, mainly local breeds, tied stalls and loose housing, animals with or without horns
- I2 : Piemonte, suckler herds and / or fattening bulls, tied stalls and loose housing (incl. group pens) ; animals with or without horns
- I3 : Veneto, intensive dairy production, flat area, no summer grazing, free stalls, mainly animals without horns

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The German focus groups

- G1 : Bavaria, dairy farmers, organic farming with horned cattle in loose housing
- G2 : Saxony, conventional farmers with suckler cows in loose housing, animals without horns, polled or disbudded
- G3 : North Rhine-Westphalia, conventional intensive dairy production, loose housing, animals without horns

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The French focus groups

- F1 : Brittany, intensive dairy production, in loose housing, animals without horns
- F2 : Auvergne, mountain area, dairy and/or suckler cows (rustic breed), loose housing or tied stalls, animals with or without horns
- F3 : Limousin, suckler farmers in loose housing, mainly animals without horns (some have polled cows)

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Main findings

- Many farmers have chosen to keep horns or not a long time ago : changes are difficult to face or imagine
- Working with horned or hornless animals results from and implies different views on the farmer profession and on the practical and daily work with the animals.
- The farmers have often several complementary reasons to justify their choice.

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In favour of keeping horned animals

- In tied stalls : few risks, tradition
- In loose housing :
  - Ethic considerations (integrity of the animal, avoidance of pain and stress)
  - Strong farmer-animal relation-ship
  - Better animal health and product quality
  - Specific practices, equipment (larger space allowances) and skills

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In favour of dehorning or keeping polled animals

- Stockman's safety
- Animal's safety (linked to the interactions between the animals)
- In connection with the housing and equipment / loose housing
- Other reasons : e.g. commercial specifications
- not necessarily related to a worse farmer-animal relationship

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Disbudding and dehorning method

- Disbudding is very frequent : easier and less painful
- Disbudding mostly with hot iron (thermic method), few drugs/ sedation, anaesthesia or analgesia
- Dehorning : for purchased or injured animals, to tighten young animals or in case of calving outdoors

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Animal pain during disbudding

- Most farmers think that the animals suffer during disbudding
- but the views on the extent differ largely

For many farmers who disbud :

- it is brief
- the handling itself puts the animals under stress
- there are real benefits for both the farmers and the animals

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Using polled cattle

- Many participants in the focus groups were prepared to use polled cattle (57 out of 94)
  - But the available quality is often not satisfactory (yield and reproduction criteria) and it is not feasible at short notice
- The others have ethic concerns towards genetic modifications
- Some do not want to have polled cattle, they would like to go on choosing their animals independently of the horns

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Thank you for your attention !

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Key points:

1. Three focus groups in 3 countries (FR, DE, IT) with various types of farmers and types of production (loose vs. tied, dairy vs. beef, with vs. without horns)
2. Most farmers have decided to have cows with or without horns for a long time → changes are difficult to imagine and they see difficult the adaptation
3. Working with animals horned or dehorned has a large impact on how the farmer sees his/her job and on daily work
4. When reasons for dehorning or not are asked, they use to have a combination of them, not being only one reason

For those in favour of keeping horned animals

- in tie stalls: few risks, tradition (including esthetical considerations)
- in loose housing: ethics (respect to the integrity of animals, avoid pain during the dehorning) – They prefer to adapt the living conditions of animals than adapting animals; there are stronger farmer-animal relationship; they think they have better health and better production (horned animals→ better milk); they have specific equipment and practice (eg when a new animal is introduced)

For those in favour of dehorned or polled animals

- stockman safety
- animals' safety (linked to interactions between animals)
- linked to loose housing
- commercial specification (when animal are sold: they look younger without horns)

They think is not necessarily related to a worse animal-human interaction

5. Methods: disbudding (far more frequent, less painful) especially with hot iron, the use of drugs are rare
6. Pain: yes but pain is brief and benefits counterbalance the pain
7. polled: the quality of polled animals (production, reproduction) is not sufficient, little availability + ethical reasons

8 Slide presentation by Ute Knierim (UKA): 'Keeping horned cattle: benefits and drawbacks'.

Task 2.2.1:

Benefits and drawbacks of dehorning and keeping fully horned cattle

U. Knierim, N. Irrgang, B. Roth, T. Gorniak

Ute Knierim
Dept. Farm Animal Behaviour & Husbandry
organicagriculturalsciences UNIKASSEL

Contents of scientific and technical review

- Arguments for and against disbudding/ dehorning (incl. long-term consequences of disbudding/dehorning)
- Legal situation
- Methods of disbudding/dehorning
- Stress and pain alleviation during disbudding/ dehorning
- Alternative: keeping fully horned cattle

Ute Knierim
Dept. Farm Animal Behaviour & Husbandry
organicagriculturalsciences UNIKASSEL

Development and anatomy of horns

- bud starts to form during first 2 months of life,
- **> 2 months**: horn bud attaches to the skull, small horn starts to grow,
- **~ 7-8 months**: of age hollow centre of horn core opens directly into the frontal sinuses of the skull.

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Dept. Farm Animal Behaviour & Husbandry
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Arguments for disbudding/dehorning

- **Human safety and ease of management**
  - But: Austrian study: about 86 % of all accidents had other causes than horn trusts, only 1 deadly accident due to horns, 7 due to butting by hornless cows, 6 cases due to pushing with whole body or leg kicking,
  - no scientific evidence that horned cows are more aggressive.

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Dept. Farm Animal Behaviour & Husbandry
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Arguments for disbudding/dehorning

- **Animal social stress and injuries**
  - Especially during transport & slaughter.
  - But: levels of social stress and bruises in dehorned cattle under standard conditions?

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Arguments for disbudding/dehorning

- **Economics**
  - Higher investment and labour costs for proper keeping of horned cattle,
  - (reduced sale value of leather),
  - milk loss due to injuries,
  - financial penalties on sale of horned cattle,
  - no access to certain cattle markets.

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Arguments for disbudding/dehorning

- **Animal social stress and injuries**
  - Especially during transport & slaughter.
  - But: levels of social stress and bruises in dehorned cattle under standard conditions?

Ute Knierim
Dept. Farm Animal Behaviour & Husbandry
organicagriculturalsciences UNIKASSEL

Arguments for disbudding/dehorning

- **Culture**
  - Depending on breed and region.

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Arguments against disbudding/dehorning

- **Effects on animals**
  - adjusting animals to husbandry system may involve increased social stress,
  - some scientific evidence that horned cattle uses less physical agonistic interactions,
  - potential effects of horns on metabolism, sensory inputs, immune system, vitality, fertility and milk quality.

Arguments against disbudding/dehorning

- **Ethics**
  - Avoid pain and distress,
  - horns crucial part of the cow's nature – integrity.
- **Culture**
  - Depending on breed and region,
  - Symbol of "peasant culture",
  - touristic aspects.

EU legal situation

Council of Europe (Recommendation Concerning Cattle 1988):

< 4 weeks of age: chemical or heat cauterisation with instrument producing sufficient heat for at least ten seconds – no anaesthesia, but performed without causing unnecessary or prolonged pain or distress by skilled operator.

> 4 weeks: local or general anaesthesia by a veterinary surgeon or any other person qualified in accordance with domestic legislation.

EU legal situation

Council Regulation (EC) No 834/2007 on organic production:

- allowed if **authorised** by competent authority on case to case basis,
- reduce suffering to a minimum by applying adequate **anaesthesia and/or analgesia** and
- by carrying out the operation only at the most appropriate **age**
- by **qualified personnel**.

EU – national legal situations

Non-uniform:

- No or nearly no regulation in majority of countries;
- often (different) **age limits**;
- often vet and anaesthesia required for **dehorning** (12 countries);
- more rarely anaesthesia required for **disbudding** (at certain ages or with certain methods) (8 countries).

Methods of disbudding/dehorning

Disbudding:

- Cautery
- Caustic paste
- Scoop

Dehorning:

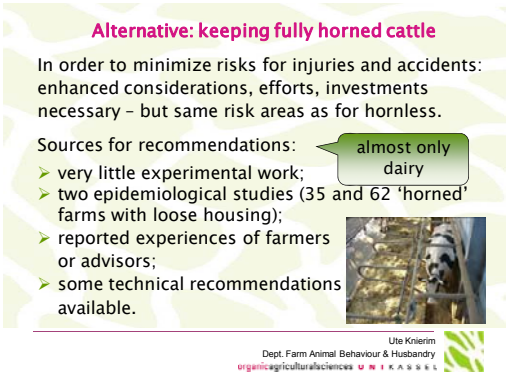
- Scoop, shears;
- Wire/saw.

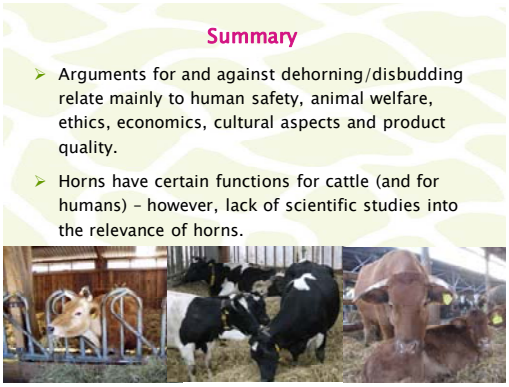
Stress and pain during and after disbudding/dehorning

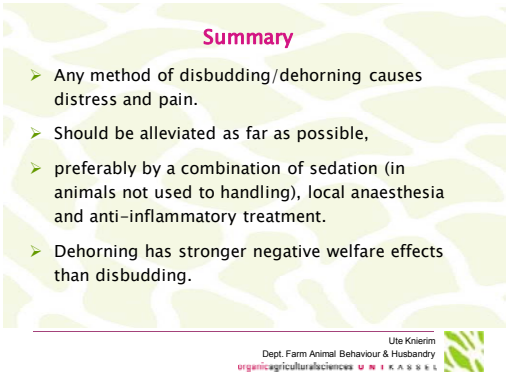
- Indications of severe pain, but different time courses and qualities depending on method;
- no scientific evidence for differing pain perception at different ages;
- differences after disbudding/dehorning due to differing wound sizes ⇨ disbudding preferable to dehorning;
- Long-term pain possible, but no investigations longer than 13 days (mostly only 24 h);
- distress due to handling possible.

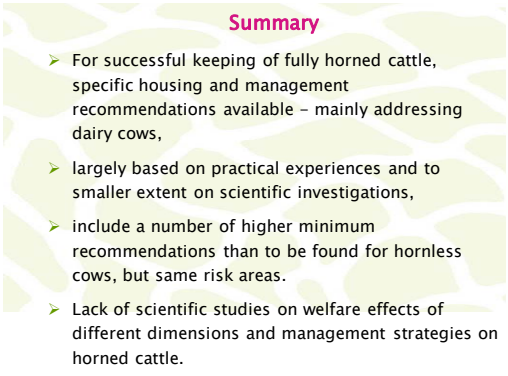
Stress and pain alleviation

- **Sedation:** alleviates stress of handling, eases management; drawback: control of anaesthesia may be impaired ⇨ only in cattle unused to handling; nearly no pain relief!
- **Local anaesthetic:** immediate pain and stress relief – appropriate concentrations and volumes, individual control of efficacy important!
- **Nonsteroidal anti-inflammatories**: reduce pain following disbudding/dehorning.









Key points:

Arguments for and against dehorning/disbudding relate mainly to human safety, animal welfare, ethics, economics, cultural aspects and product quality.

Horns have certain functions for cattle (and for humans) –however, lack of scientific studies into the relevance of horns

Any method of disbudding or dehorning causes distress and pain

Should be alleviated as far as possible

Preferably by a combination of sedation (in animals not used to handling), local anaesthesia and anti-inflammatory treatments

Dehorning has stronger negative welfare effects than disbudding

For successful keeping of fully horned cattle, specific housing and management recommendations available –mainly addressing dairy cows

Largely based on practical experiences and to smaller extent on scientific investigations

Include a number of higher minimum recommendations than to be found for hornless cows, but same risk areas

Lack of scientific studies on welfare effects of different dimensions and management strategies on horned cattle

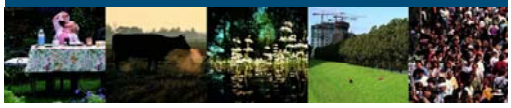
9 Slide presentation by Jack Windig (ASG): 'Selection and keeping of polled cattle'.

Polled cattle

An alternative for dehorning?

Jack J. Windig

Animal Breeding & Genomics Centre



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Background

- One single gene
- Polled (=hornless) dominant over horned:

PP or Pp pp

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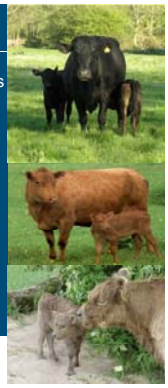
Completely polled breeds

- Polledness dates back to pre-Roman times
- Polled breeds mainly in Britain and Scandinavia
  - Aberdeen Angus (GB)
  - Galloway (GB)
  - Belted Galloway (GB)
  - British White (GB)
  - Polled Hereford (GB)
  - Poll Red (GB)
  - Swedish Red Polled (S)
  - Norwegian Old Red Polled Ostland – Vestland (N)
  - Estonian Red (Est)
  - Several crosses, mainly beef



Frequeny polledness in different breeds

Breeds with high frequency (>20%) of polled animals
- Norwegian red, Sussex, Welsh Black, Australian beef cattle

Breeds with a few polled bulls available (originally <5%)
- Holstein, Jersey, Simmental, Fleckvieh, Ayreshire, Charolais, Limousin, Blonde d'Aquitaine
- …

Breeds without polled animals
- Dutch: Groningen Whiteheaded, Dutch Belted, Deep Red, MRIJ, Friesian
- Highland cattle. Etc.

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Situation in Holstein Friesian

- At least 38 bulls with P gene available for AI
  - Only two homozygous (PP)

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Breeding values

- Quite low for polled bulls (apr 2008)

	Top 100 (Index)	Polled 38
Index (NVI)	185 (+161 +309)	11 (-56 +114)
Milk	880 (+560 +2620)	350 (-1300 +1500)
%fat	-0.08 (- 0.59 +0.86)	-0.20 (- 0.69 +0.28)
%protein	+0.03 (- 0.25 +0.31)	-0.13 (- 0.35 +0.12)
Production	103 (-38 +201)	-28 (-114 +57)
Longevity	447 (86 780)	176 (11 398)
Cell Count	103 (90 112)	102 (95 108)
Fertility	99 (90 108)	101 (93 107)
Leg conformation	106 (97 112)	100 (94 103)

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Breeding program in Holstein?

- Classic introgression program
  - Takes > 20 years
  - Cannot close the gap completely
- Genomic selection
  - Use of dense marker maps to estimate breeding values at birth
  - Can produce bulls with high breeding values <10 years

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Situation in French Charolais

- 1960s polled animals present in a few herds
- 1980s One breeder with 40-50% polled animals
  - Low genetic value
- 1990s introgression program started using AI and some markers
- Now several AI bulls
  - with high genetic value
  - With scurs

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Situation in German Fleckvieh

- 1900s polled animals present
- 1974 Breeding program started in Bavaria
  - Suckler herds
- 1992 breeding program for dual purpose
- 2009
  - > 90% of calves born in suckler herds are polled
  - Heterozygote dual purpose AI bulls available

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Summary polled cattle

- One gene
  - Some breeds completely polled
  - Other breeds low frequency, with low genetic merit
- Breeding program possible
  - Classic introgression >20 years
  - Successful in Charolais and Fleckvieh
  - To be started in Holstein
  - Genomic selection <10 years

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Polled cattle in future?

- Depends on
  - Policy makers / General Public
    - Is it acceptable?
    - Or is dehorning inacceptable?
  - Breeders
    - Will they breed polled bulls of high genetic merit?
  - Farmers
    - Do they want to use polled bulls?

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General public

- Social research under Dutch citizens
  - Cows with horns are seen as more natural and better for animal welfare than cows without horns
  - No distinction is being made between naturally polled cattle and dehorned cattle
  - Opinions are not very strong
  - Information changes the opinion of a part of the consumers
- Breeding polled cattle only acceptable if
  - Distinction breeding - genetic modification is clear
  - Polled cattle is seen as natural

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Farmers

- Dehorning is not an issue
  - Routine job
  - Not too expensive
  - Necessary to avoid injuries
- Polledness not (yet) an alternative
  - Generally low breeding values
  - Too few bulls available for choosing
- Quick change to >90% polled possible
  - Once more polled bulls with high genetic merit available

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Breeding companies (Holstein)

- Some small breeding companies
  - Burket Falls, Hickormeaya (USA) Göpel (D)
  - Specialised in polled cattle
- Large breeding companies
  - CRV (NL), Alta (Can)
  - Investigating, possibly will start breeding program
- Monsanto
  - Sequenced gene
  - Filed patent
  - plans??

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Polled cattle an alternative for dehorning?

- Yes
  - Polled cattle with high genetic merit are being bred
  - Will be used at a large scale by farmers
- Is it better or worse than other alternatives?
  - Better if adaptation to stables/management not possible
  - Worse if (much) natural behavior not possible without horns
    - Limited effects??

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Key points:

Polled animals come from 1 gene, dominant

1. Breeds:

Some cattle breeds are polled and this come from the roman times ! (Aberdeen angus, Galloway…)

In some breeds pooled animals are common (eg Norwegian red), but in most breeds polled animals are rare

Few breeds with no polled animals at all

2. Situation in the Netherlands

Only 2 sires are homozygote for the polled gene

Polled bulls have a lower genetic index.

How to increase the number of polled animals?

→ Classical introgression programme: needs at least 20 years

→ Alternative: genomic selection. Use a marker in DNA and determine the breeding value (from birth) then it is possible to speed up the selection. Could be possible in less than 10 years

3. Situation in Charolais breed

Introgression programme in France: after 20 years they have now polled bulls with high genetic value. However, animals present scurs (very small horns, not attached to the skull)

4. Situation in German, Fleckvieh breed

Breeding program started in 1974 and now there are good bulls available

5. Questions

Reaction of the public:

5.1 Cows with horns are seen as more natural (so better for animal welfare).
5.2 No distinction is made between polled and horned cattle
5.3 Breeding polled cattle is acceptable if they don't came from genetic modification and if poled cattle are seen as natural

Reaction of the farmers:

5.4 Farmers used to dehorning don't see polled animals as an alternative because too few sires (so farmers don't have a choice).
5.5 Once exit several bulls with high genetic value, then OK

Breeding companies:

5.6 Some small companies are specialised in polled animals

5.7 Large companies are investigating polled animal

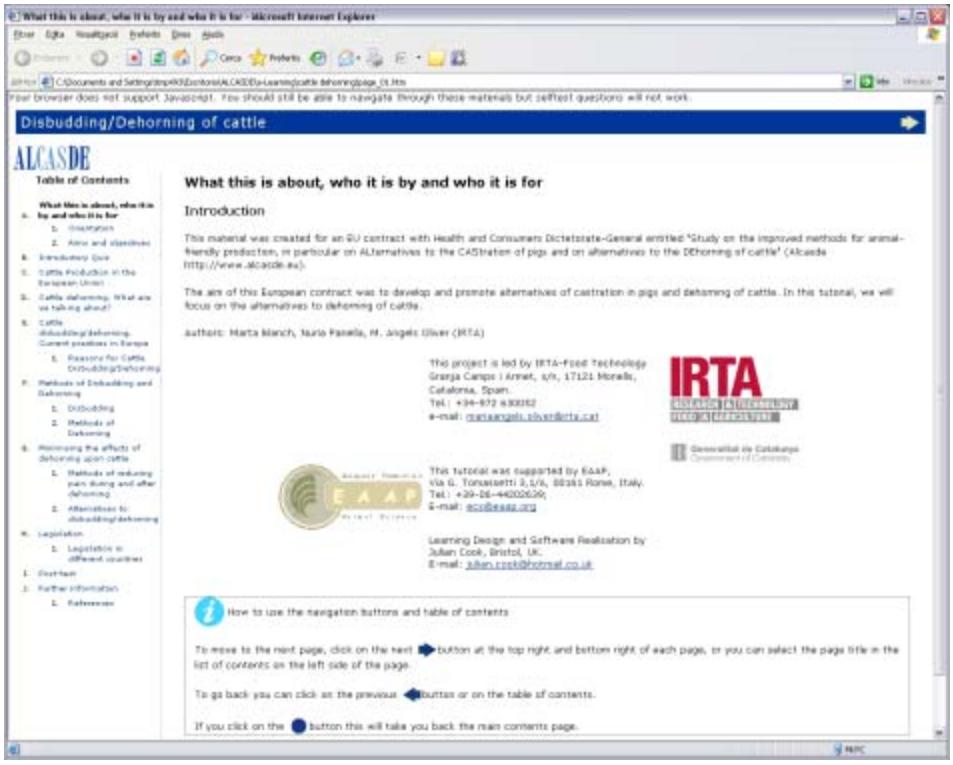
6. An alternative to dehorning?

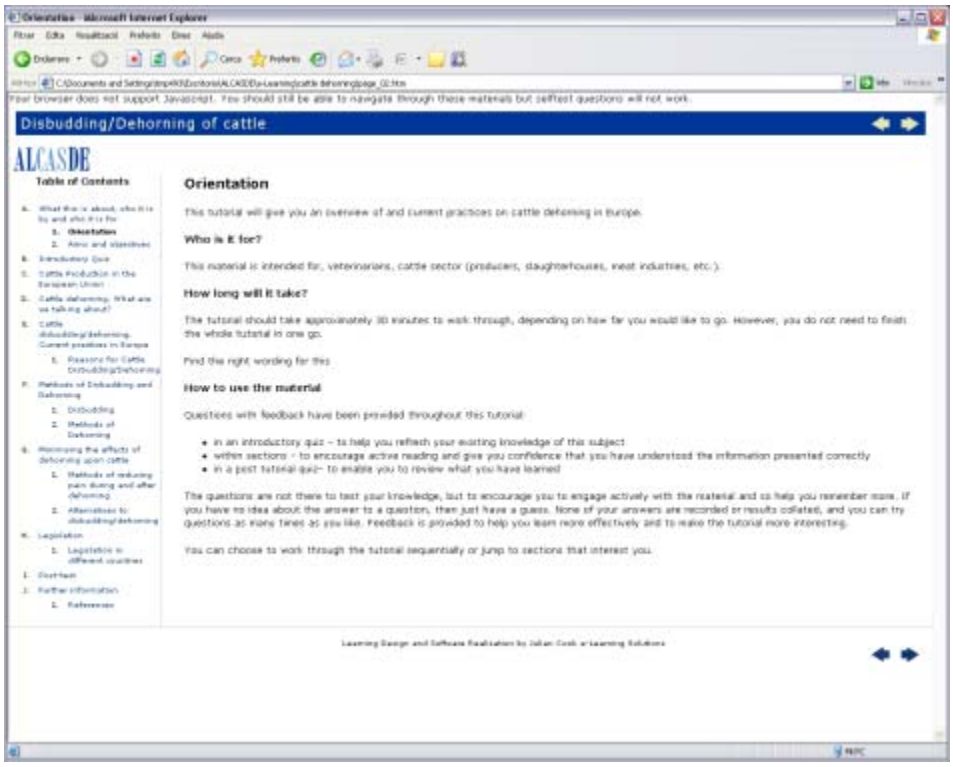
6.1 If it is not possible to adapt the housing and the management, it is better to have polled cattle than dehorned ones

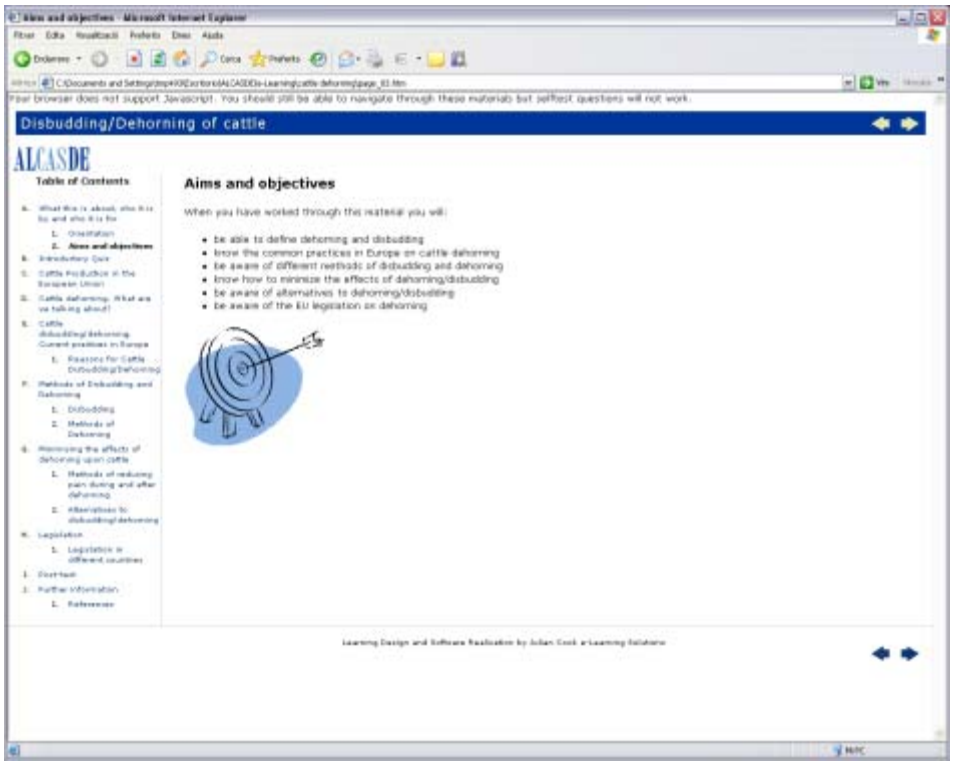
6.2 But if animals can’t express their behaviour so it’s not good

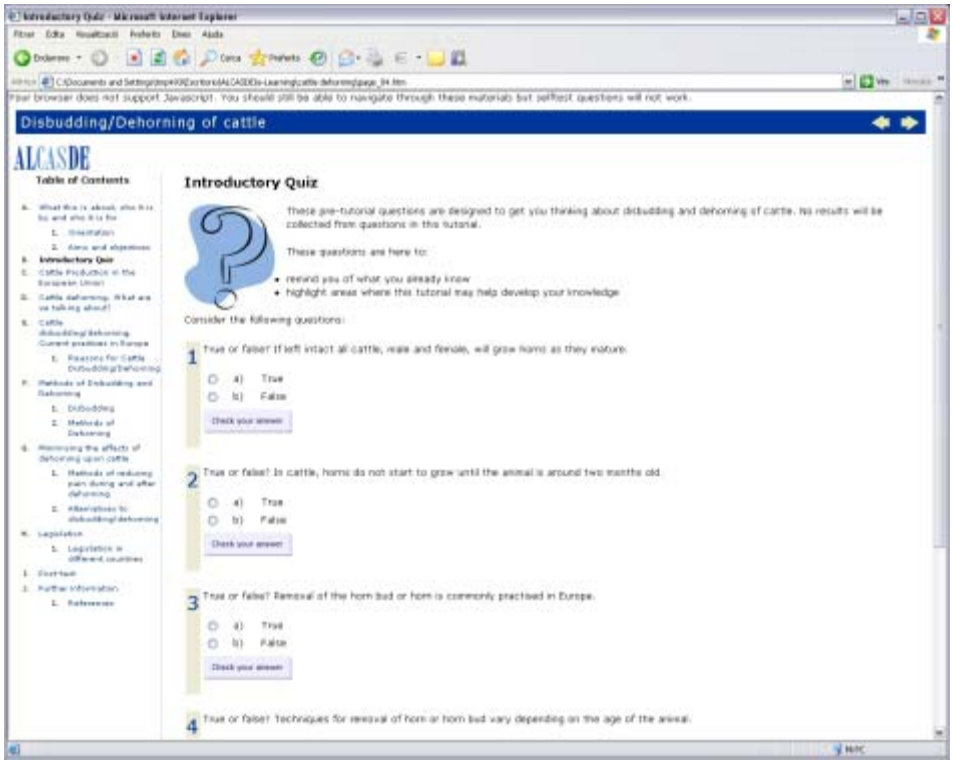
6.3 Think about sheep, which are mostly horned, with no debate about it

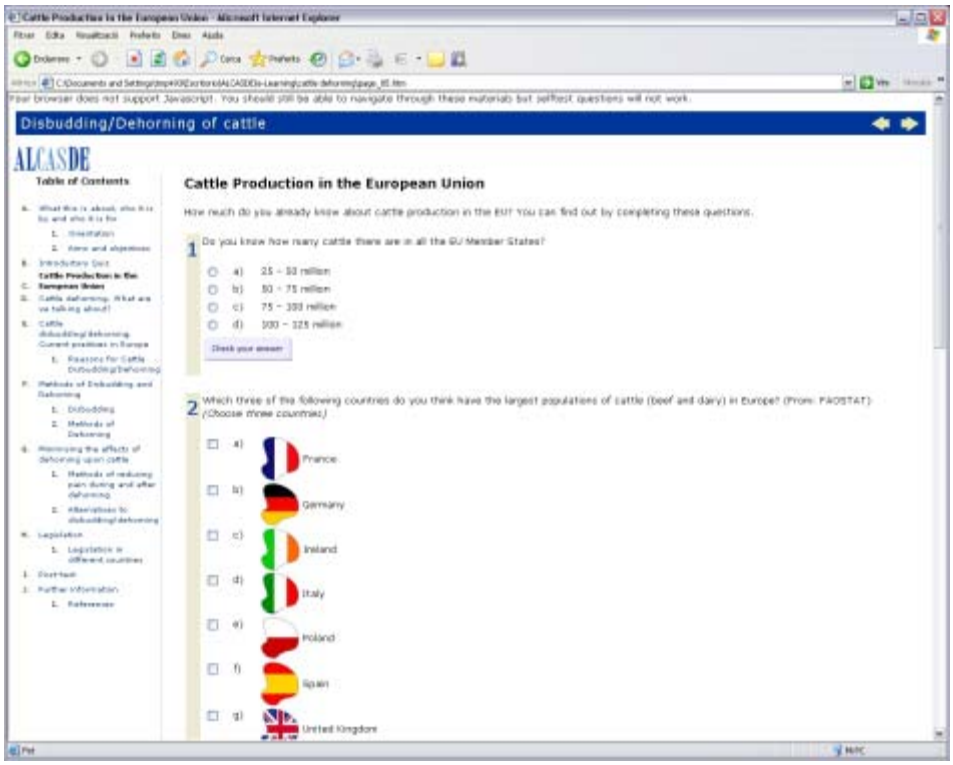
10 Slide presentation by Cledwyn Thomas (EAAP): 'Demonstration of the e-learning'.

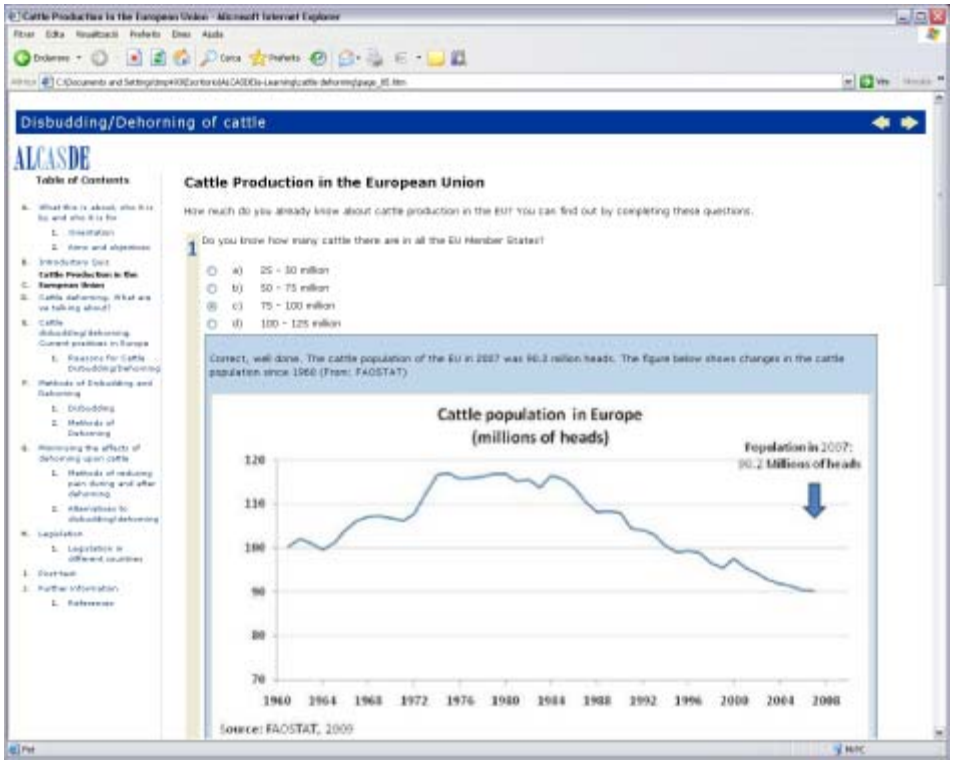





Disbudding/Dehorning of cattle
ALCASDE
Table of Contents
Aims and objectives
When you have worked through this material you will:
be able to define dehorning and disbudding
know the common practices in Europe on cattle dehorning
be aware of different methods of disbudding and dehorning
know how to minimize the effects of dehorning/disbudding
be aware of alternatives to dehorning/disbudding
be aware of the EU legislation on dehorning


Disbudding/Dehorning of cattle
ALCASDE
Table of Contents
Introductory Quiz
These pre-tutorial questions are designed to get you thinking about disbudding and dehorning of cattle. No results will be collected from questions in this tutorial.
These questions are here to:
remind you of what you already know
highlight areas where this tutorial may help develop your knowledge
Consider the following questions:
1 True or false? If left intact all cattle, male and female, will grow horns as they mature.
a) True
b) False
2 True or false? In cattle, horns do not start to grow until the animal is around two months old.
a) True
b) False
3 True or false? Removal of the horn bud or horn is commonly practised in Europe.
a) True
b) False
4 True or false? Techniques for removal of horn or horn bud vary depending on the age of the animal.


Disbudding/Dehorning of cattle
ALCASDE
Table of Contents
Cattle Production in the European Union
How much do you already know about cattle production in the EU? You can find out by completing these questions.
1 Do you know how many cattle there are in all the EU Member States?
a) 25 - 50 million
b) 50 - 75 million
c) 75 - 100 million
d) 100 - 125 million
Check your answer
2 Which three of the following countries do you think have the largest populations of cattle (beef and dairy) in Europe? (From: FAOSTAT)
(Choose three countries)
a) France
b) Germany
c) Ireland
d) Italy
e) Poland
f) Spain
g) United Kingdom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1 Do you know how many cattle there are in all the EU Member States?
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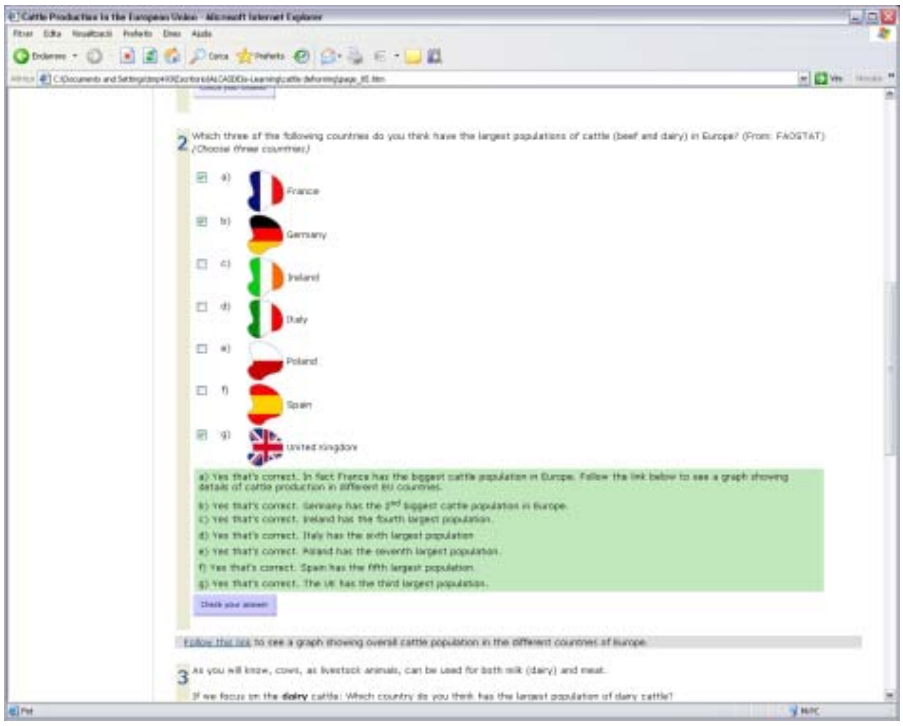
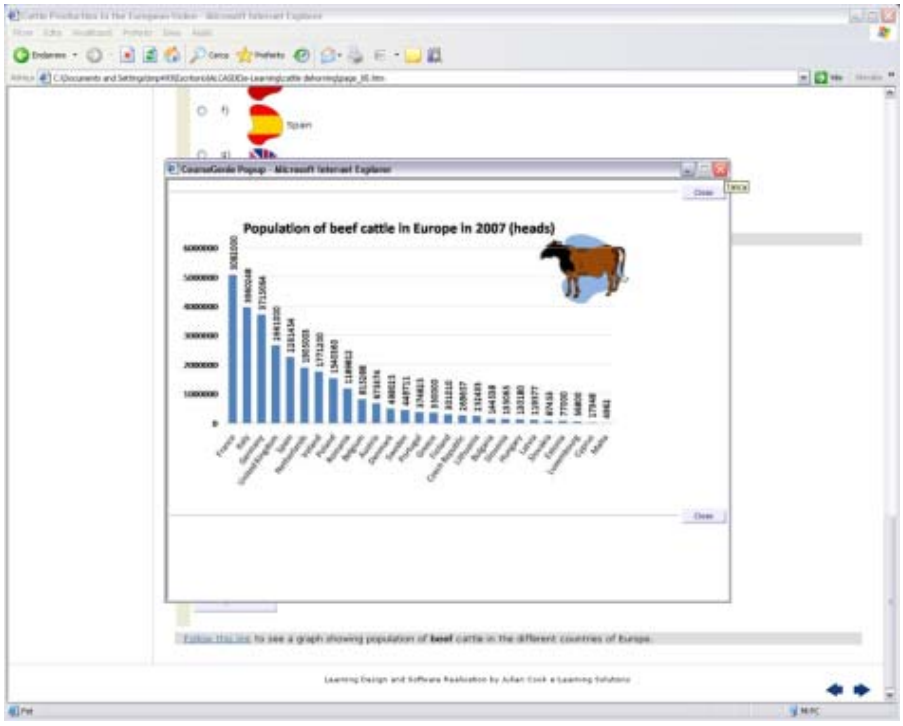
b) 50 - 75 million
c) 75 - 100 million
d) 100 - 125 million
Correct, well done. The cattle population of the EU in 2007 was 90.2 million heads. The figure below shows changes in the cattle population since 1960 (From: FAOSTAT)
Cattle population in Europe
(millions of heads)
Population in 2007:
90.2 Millions of heads
120
110
100
90
80
70
1960 1964 1968 1972 1976 1980 1984 1988 1992 1996 2000 2004 2008
Source: FAOSTAT, 2009





Key points:

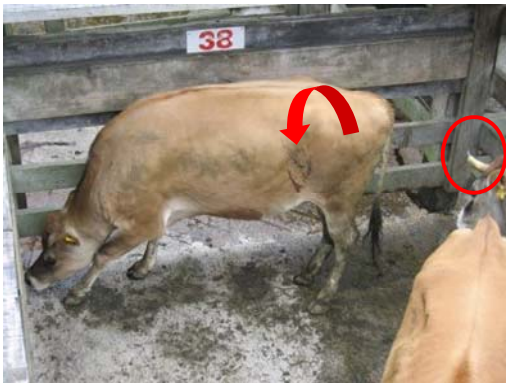
E-learning is widely used in human medicine

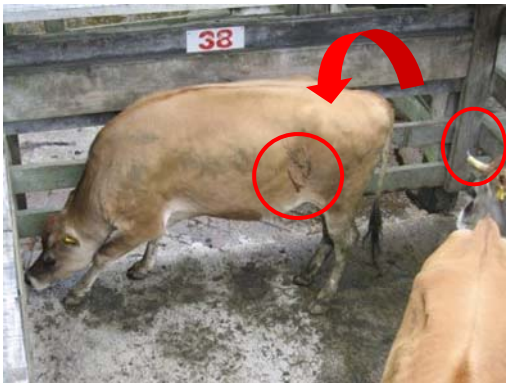
Basic idea: e-learning is interactive

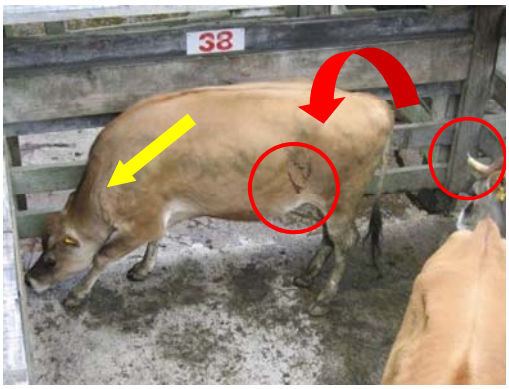
Nowadays the material is only on alcasde internal website. If DG-Sanco approves it then they may put it on a public website, with links in several websites.

11 The stakeholder approach: Expectation and proposal to improve animal welfare in relation with dehorning:

11.1 Veterinaries: Slide presentation by Nick Blayney (Federation of Veterinarians of Europe)



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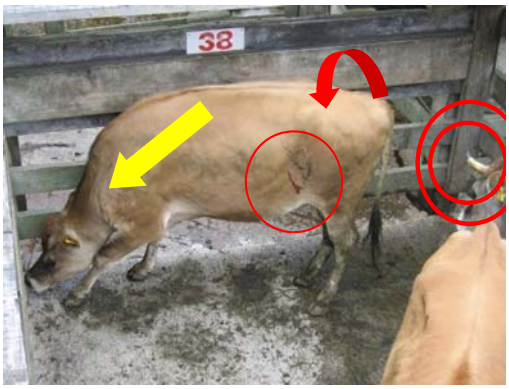
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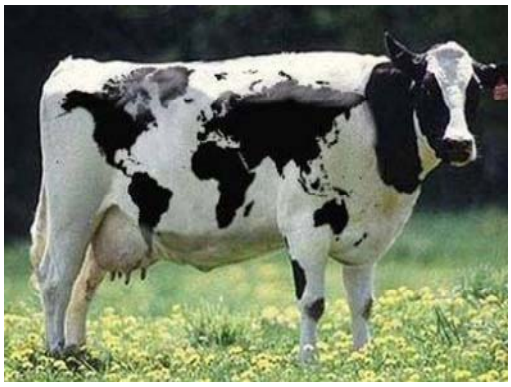


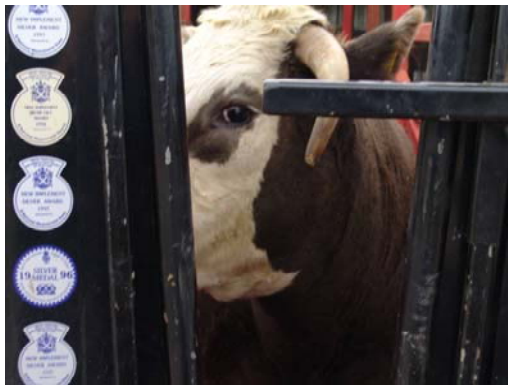


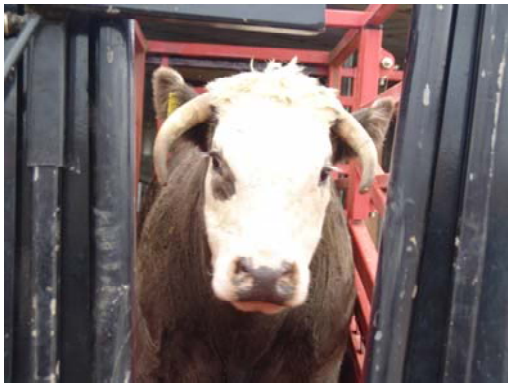


Caustic

Paste

.

27

28

The stakeholder approach:

Expectation and proposal to improve animal welfare in relation with dehorning

32

FAWC
Farm Animal Welfare Council

33

FAWC
Farm Animal Welfare Council

376: Parts of UK Law currently unsatisfactory

- chemical cauterisation
- disbudding and dehorning can be done by unqualified person

34

FAWC
Farm Animal Welfare Council

Disbudding is preferable to dehorning

35

FAWC
Farm Animal Welfare Council

Genetic selection of polled animals

36

37

Recommendations

39

Recommendations

378:Suitable training for disbudding

379:Should be done before 2 months of age

380:Chemical cauterisation should not be used

40

Recommendations

381:Dehorning only by a veterinary surgeon

41

Recommendations

382:Analgesia as well as anaesthesia

383:Proper use of local anaesthesia

384:Review of legislation regarding age – under 2 months

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Federation of Veterinarians of Europe
www.fve.org • info@fve.org

Goats

43

Federation of Veterinarians of Europe
www.fve.org • info@fve.org

Goats

44

45

Hominum animaliumque salut
to the Health and Welfare of Man and Animal

Key points:

Either the whole herd is dehorned or horned (problems when some animals have horns and others not)

Cattle with horns are more dominant!

- Dairy herds:

In large herds, with few caretakers and lots of mechanical systems: better to dehorn

Price of housing → space allowance is low

Feed barriers → eating in a row (every 1 m)

- Beef cattle:

Horns are less of a problem, especially for humans

More difficult to handle horned cattle in a yoke, horns are dangerous for the handler in a yoke (bail crush), accidents to horns during handling

Danger to approach cows/calves around calving

Method in UK: farmers disbud (heat) with local anaesthetics (allowed if the person has been trained but nobody checks → allowed)

Nerve between eye and horn very easy to block. However, some animals have another nerve next to the horn that needs also to be blocked.

Alternative methods: caustic paste. May cause problems if not used appropriately (too largely put around the bud, animal go in the rain). It is not very popular in UK

It is likely that because animals have been dehorned during several years, we did not remove animals with bad horns due to genetic (e.g. rounded toward the eye, the only way to remove it is to use a wire saw) and so it is likely that leaving horned animals this problems will be more common than expected

Problems when dehorning is done in summer: sinusitis with parasites

According to the FAWC: disbudding is less painful than dehorning

Genetic solution: there are other issues that can be dealt with genetics that could improve cattle welfare (eg dystocia…).

Recommendations from FAWC:

Non vets should be appropriately trained for disbudding

Disbudding should be done before 2 months of age

Chemical cauterisation should not be used

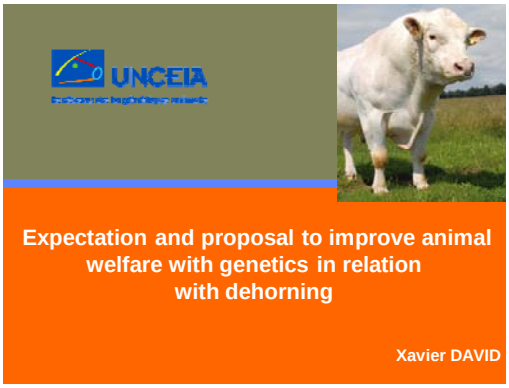
Dehorning only by a veterinary surgeon and if necessary

Analgesia as well as anaesthesia

Proper use of local anaesthesia

Review of legislation regarding age under 2 months

11.2 Producers and breeders: Slide presentation by Xavier David (UNCEIA)



Outline

- Background
- Different phenotypes
- Genetics of Polled gene
- Polled vs Horned
- How to increase Polled gene
- Breeding for the Polled gene: example of the Charolais breed
- Conclusion and perspectives

Alternatives to the dehorning of cattle – Bologne 28 th October

BACKGROUND

- Majority of breeds are horned
  - Frequency of polled is very low
- Increasing concern over several aspects of horned animals
  - Animal welfare
  - Human welfare
  - Economics: cost of dehorning and production – e.g. carcass damage

Alternatives to the dehorning of cattle – Bologne 28 th October

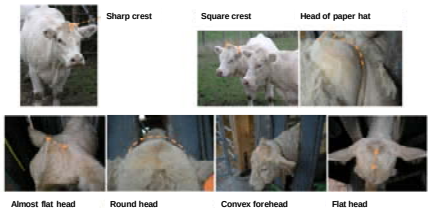
Phenotype of hornes

- 3 phenotypes
  - horned
    - Hornes are totally developed and Welded in the frontal bone
    - Polymorphism of the size and the shape of the horn


Alternatives to the dehorning of cattle – Bologne 28 th October

Phenotype of hornes

- 3 phenotypes
  - « Polled »



Alternatives to the dehorning of cattle – Bologne 28 th October

Phenotype of hornes

- 3 phenotypes
  - « Scurred »
    - Not completely developped horns (scurs) and not welded in the frontal bone
    - The size of the scurs goes from small hornes buds to normal not welded hornes

Alternatives to the dehorning of cattle – Bologne 28 th October

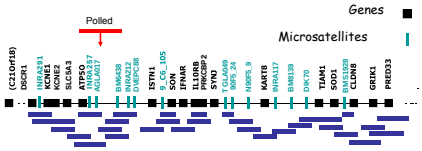
Genetics of Polled gene

- Absence of horns is controlled by a single major gene – Polled (P) gene BTA1
- Scurred is not controlled by the same gene
- Animals have 2 alleles for polled gene
  - P or p
  - P is dominant to p
- Three genotypes & two phenotypes for polledness

Alternatives to the dehorning of cattle – Bologne 28 th October

BTA1 region of the gene Polled

- Localisation
- Identification of genetic markers associated to the phenotyp



  - But no identification of the gene nor the causal mutation

Alternatives to the dehorning of cattle – Bologne 28 th October

Genetics of Polled gene

Genotype		Phenotype
PP	Homozygous dominant	Polled
Pp	Heterozygous	Polled
pp	Homozygous recessive	Horned

Genetics of Polled gene

Genetics of Polled gene

Parents	PP×PP	PP×Pp	PP×pp	Pp×Pp	Pp×pp
Progeny					
PP	100%	50%	-	25%	-
Pp	-	50%	100%	50%	50%
Pp	-	-	-	25%	50%

Genetics of Polled gene

- **Difficult to achieve 100% p as recessive gene is "hidden" in heterozygotes**
- **Actual "causal mutation" for polledness has yet to be identified**
- **Research indicates gene resides on bovine chromosome 1**
- **Markers are available that are linked to the polled gene (95% successful)**

Polled vs. Horned

· Evidence to suggest use of Polled bulls is increasing - % registrations (Canada)

Breed	1989	1999
Limousin	18	49
Simmental	14	32
Charolais	38	65

How to increase polled animals

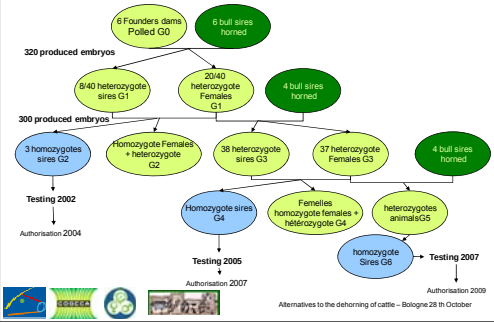
There are 2 methods :

- Genetic Introgression
- Marker Assisted Selection

Gene Introgression

- **Example : Introgression of polled gene in Charolais selection scheme**
  - – **Driven since** 1994 between Gènes Diffusion Optimal (UCEF-UCHAVE), INRA and Institut de l'Elevage
  - – A cows herd in Charolais breed showed sometimes naturally polled animals and seemed to transmit this trait to the progeny

Introgression scheme

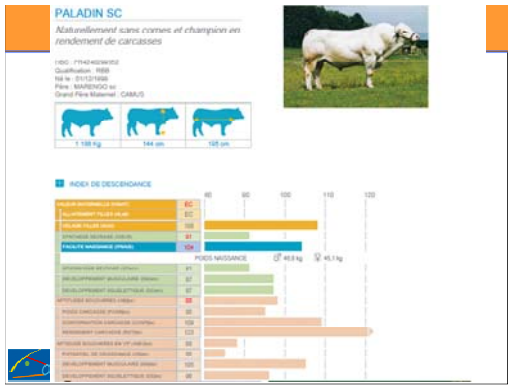


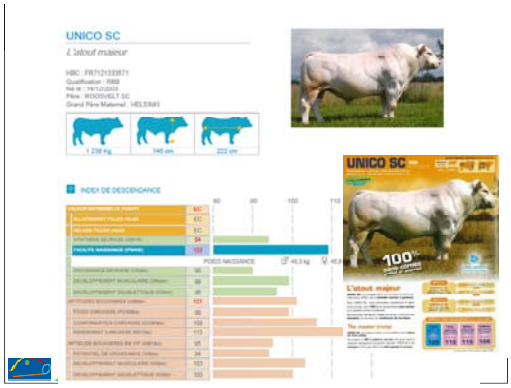
Gene Introgression

- **Critical Requirements**
  - – The deal is that you work on the polled gene and not on zootechnical performances
  - – Large representative sample of animals from the horned breed should be used to ensure the polled strain has as much genetic variation as the horned breed
  - – If selection on other traits is desired a large population of carriers at each backcross generation is required

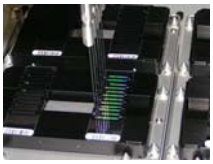
Gene Introgression

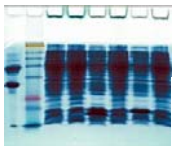
- Time consuming (7th generation since 1994) and costly
- Important to determine whether the economic benefits at the end of the program are likely to exceed those if conventional selection was followed
- Genetic Lag – reduction in performance in the crossbred population because the donor line may be inferior for traits that have been selected for many generations in the recip





A technical Breakthrough





Why such a breakthrough ?

- For Cattle since 2008

Easy to genotype an animal

< 250 €
< 3 Weeks
54.000 Marker Informations (SNP)

Commercial Illumina Chip

Marker Assisted Selection

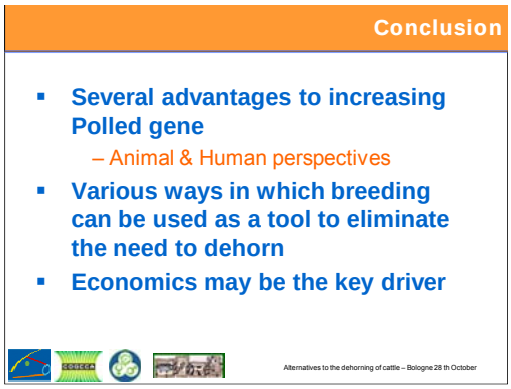
- **Markers can be used**
  - to distinguish better between carriers and polled
  - to follow the transmission of the other traits
- **Can make use to increase the frequency of the polled gene**
  - Bullsires selection
  - Young bulls selection before progeny testing

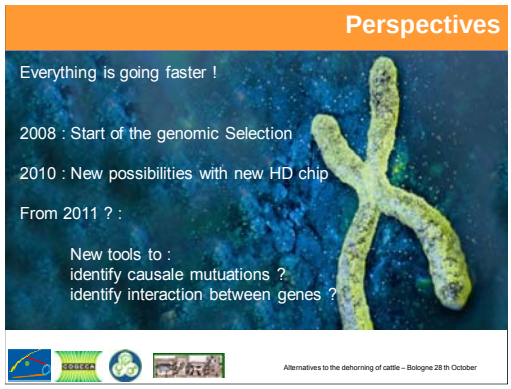
Marker Assisted Selection

- **Advantages**
  - Within breed, no need for backcrossing
  - Reducing loss in performances
  - Saving of time
- **Disadvantages**
  - Polled gene at low frequency
  - How to manage the interaction between polled and scurred gene ?

Marker Assisted Selection

- **Critical Requirement**
  - Polled animals need to be of sufficiently high genetic merit to ensure their widespread use
  - Once achieved it may be possible to increase frequency of the polled gene quickly in the population





Key points:

Horns and scurs are not controlled by the same genes

Actual causal mutation for polled gene are unkown

Tendency to have more and more polled bulls in Limousin, Simmental, Charolais and around the world, in general

Introgression takes a lot of time and it is costly

Genomic selection: great hope in new markers (SNP). Nevertheless, polled gene has a low frequency and we don’t know the interaction between polled and scur genes

11.3 Meat industry: Slide presentation by Flemming Thune-Stephensen (UECBV)

The Danish Agricultural & Food Council

Alternatives to the Dehorning of Cattle

International Stakeholder Conference

Bologna 28th of October 2009

Flemming Thune-Stephensen, DVM, Chief Adviser

Side 1

The Danish Agricultural & Food Council

UECBV - European Livestock & Meat Trade Union

Members in 27 countries
Represents 16,000 companies
Live trade, meat processing, meat trade
Beef, pig meat, sheep meat, horse meat

The Danish Agriculture & Food Counil

Represents the agricultural and food industry of Denmark.

The result of a merger between the Danish Agricultural Council, Danish Meat Association, Danish Pig Production and Danish Agriculture. Undertakes also a range of key tasks for the Danish Dairy Board.

Agriculture and food are Denmark's largest industry and innovation grouping employing some 150,000 people and exporting agricultural products and equipment total value of around €15 billion.

Side 2

The Danish Agricultural & Food Council

Dehorning – why?

- Animal welfare
- Safety at work
- Management reasons

Side 3

The Danish Agricultural & Food Council

Dehorning – animal welfare

- Horned animals have an advantage in the hierarchy
- Separation of horned and dehorned/polled animals
  - On farms
  - During transport
  - In slaughterhouses

Side 4

The Danish Agricultural & Food Council

Dehorning – safety at work

- On farms
- During transport
- In slaughterhouses

Side 5

The Danish Agricultural & Food Council

Dehorning – management reasons

- Separation of horned and dehorned/polled animals
  - On farms
  - During transport
  - In slaughterhouses

Side 6

The Danish Agricultural & Food Council

Dehorning – how?

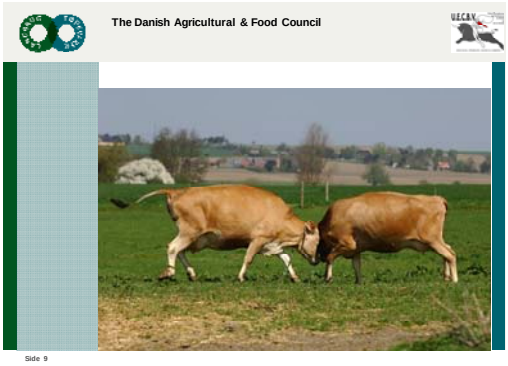
- No caustics
- Anesthesia
- Cutting
- Burning

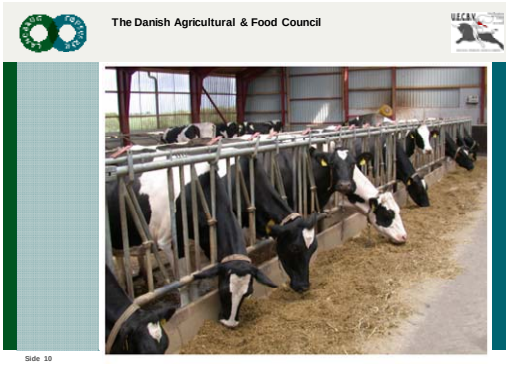
Side 7

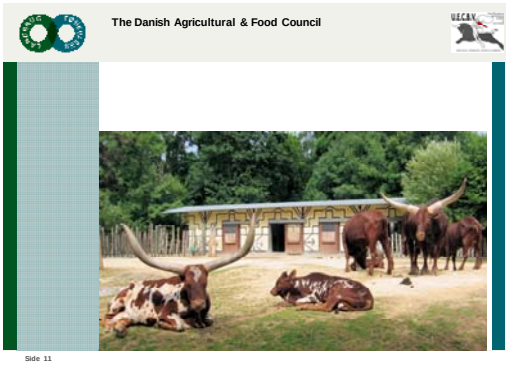
The Danish Agricultural & Food Council

The right way

Side 8







Key points:

1. Horns = reminiscence of the past
2. Horned animals have an advantage in the hierarchy
3. Dehorning- Why?: animal welfare, safety at work, management reasons

Eg: during transport: handling by truck driver; handling at slaughter...

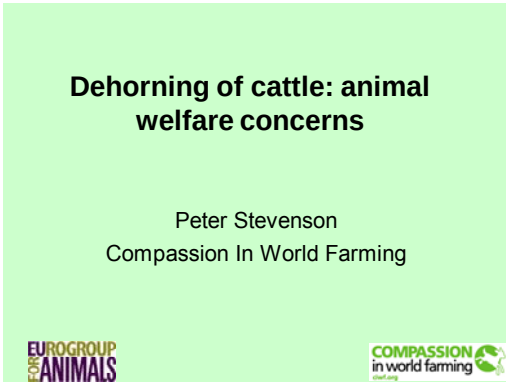
We need to separate animals with vs. without horns, especially during transport

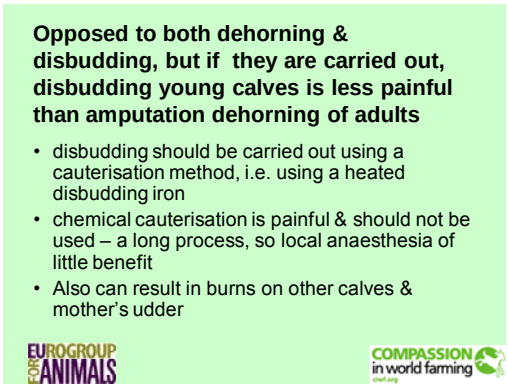
4. Dehorning – how?

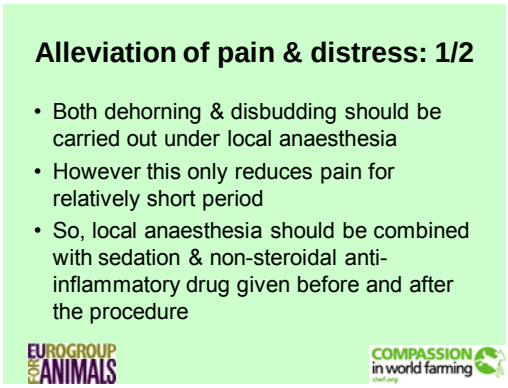
Disbudding, no use of caustic paste, and use of local anaesthesia

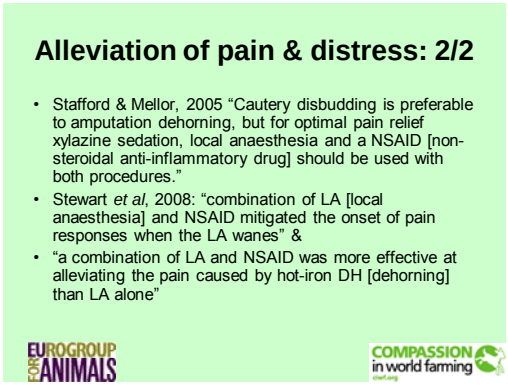
Polled: risk = if it will be at the expense of other characteristics (when you are selecting for some characters you are selecting also against others)

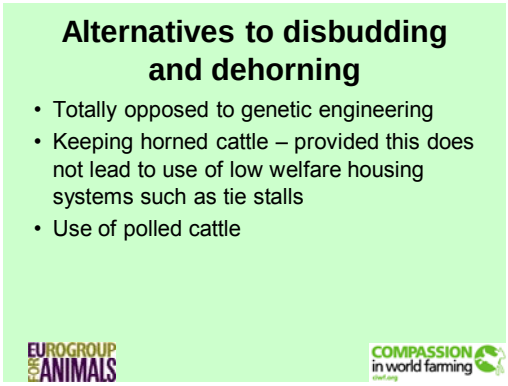
11.4 NGO's: Slide presentation by Peter Stevenson (Eurogroup for animals)

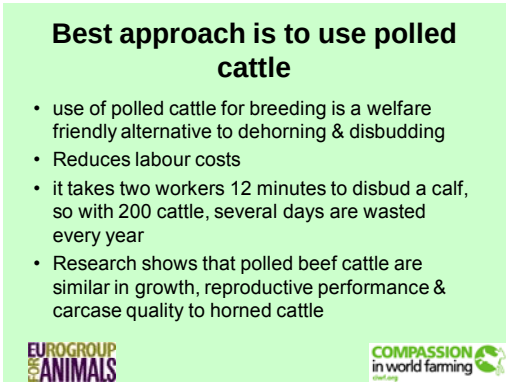


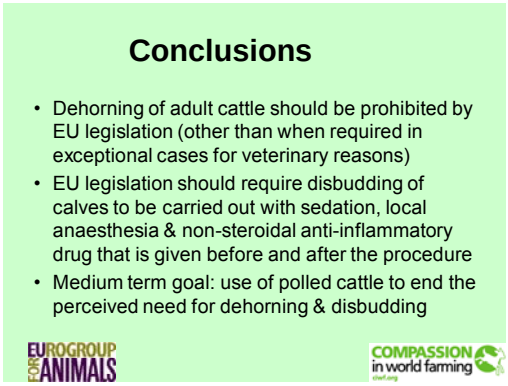












Key points:

Dehorning and disbudding are stressful

Especially in adult animals, handling for dehorning is stressful (eg sometimes electroimmobilisation is used!)

Disbudding is less painful → recommendation: disbudding by hot cauterisation (no use of caustic paste: several problems, including damaging dam udder)

No reason to dehorn an adult cattle, except for emergency reason (accident)

Recommendation: anaesthesia + sedation + analgesia (Staffor & Mellor 2005; Stewart et al. 2008)

Polled cattle is the way forward (disbudding: 12 min x 2 workers / animal)

Conclusions:

1. Routine dehorning of adult cattle should be prohibited.
2. Disbudding should be done with sedation + anesthesia + analgesia
3. Encourage polled cattle, but absolutely against to genetic manipulation

10 MIN DISCUSSION AFTER STAKEHOLDER PRESENTATIONS

Comments about sedation:

Animals are more stressed than without, because pain is not released. When the animals wake up they seem 'lost'. Cortisol levels are higher after sedation, even if only sham disbudding

Xylazine blocks movements but does not block consciousness → seems more stressful

Problems of use of medicines: no harmonisation between different countries in Europe

In some countries, farmers can use anaesthesia and analgesia

In other countries: farmers cannot use anaesthesia but could use analgesics if prescribed by a vet. In addition, in Italy, only vets can use analgesics.

Anaesthesia: the most difficult is to handle the animal properly and to have the animal in the correct situation for ensuring that the anaesthesia will work, so training courses would be necessary if these drugs should be used by farmers.

Still problems of aggression in milking parlour (waiting room) and other zones of the farm different to cases commented, such as transport

12 Slide presentation by Susanne Waiblinger (WUW): 'Further development to alternatives to dehorning'.

Further development to alternatives to dehorning


Susanne Waiblinger

Institute of Animal Husbandry and Animal Welfare,
Department for Farm Animals and Veterinary Public Health,
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Further development to alternatives to dehorning


- Keeping horned cattle
  - Main obstacles and solutions
  - advantages
  - Recommendations
- Breeding polled cattle
  - Possible drawbacks and developments
- Conclusion

Keeping horned cattle: obstacles – solutions - advantages

Main obstacles

- Human safety
  - accidents
  - injuries
- Animal welfare
  - social stress
  - injuries
- Economic losses
  - higher costs
  - loss of subsidies
  - loss of milk, (animals)
  - Disadvantages on cattle markets
  - (sale value of leather↓

on farm factor
off farm factor

Keeping horned cattle: obstacles – solutions - advantages

Main obstacles

- Human safety
  - accidents
  - injuries
- Animal welfare
  - social stress
  - injuries

Risk of accidents depends on handling practices
e.g.. Boivin et al. 1992, Waiblinger et al 2004
Horn trusts small percentage of accidents
Trachler 1993

Risk is manageable, keeping horned possible
Menke et al. 1999, 2000
Baars / Brands 2000
Schneider et al. 2008, 2009

on farm factor
off farm factor

Keeping horned cattle: obstacles – solutions - advantages

Main obstacles: Human safety, Animal welfare

Solutions: Improved handling & human-animal relation; Optimized housing & management

Recommendations for keeping horned animals

on farm factor
off farm factor

Recommendations for keeping horned cattle

- Social behaviour: basis for...
  - Stable herds
  - Lifelong bonds
  - Dominance relationships
  - Individual distance
  - Aggression - tolerance
  - Synchronicity of behaviour

- independent from horns,
- social stress also in dehorned
- more crucial for keeping horned to avoid (severe) injuries

- Principles to reduce stress & injuries
  - Sufficient space
  - Enable possibility for easy withdrawal
  - Sufficient resources to reduce competition
  - Protection of individual (weak) animals
  - Increase stability of herd
  - Avoid disturbance
  - Increase welfare by enabling relaxation, positive emotions
  - Decrease severity of injuries by decreasing sharpness of horns

Recommendations for keeping horned cattle (dairy cows)

General characteristics and structure of the housing
- Outdoor housing
- Good overview
- Well structured housing design
- Selection gates to avoid regrouping


Recommendations for keeping horned cattle (dairy cows)

- General characteristics and structure of the housing
  - Special facilities for sick or calving cows
  - Possibilities of separation in the barn

- Separation of dry or sick cows in contact with herd

Recommendations for keeping horned cattle (dairy cows)

- Acitvity / walking area
  - Spacious alley width
  - No dead end situations

r

  - Width of one way alleys not too wide

Recommendations for keeping horned cattle (dairy cows)

- Acitvity / walking area
  - Non-slippery floor in good conditon
  - Steps in deep litter systems wide enough and not too high

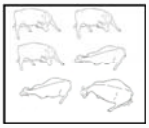
  - Outdoor run

Recommendations for keeping horned cattle (dairy cows)

- Resting area
  - Understocking of cubicles
  - Cubicles of sufficient **dimensions** and appropriate flooring
  - **Cubicles with flight possibilities to the front**

Recommendations for keeping horned cattle (dairy cows)

- Resting area
  - Free lying areas in a rectangular shape



  - Spacious resting area
  - Structuring of resting area (deep litter pen)

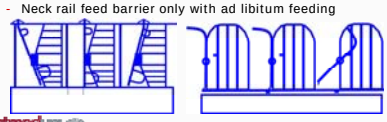
Recommendations for keeping horned cattle (dairy cows)

- Feeding area
  - Understocking of feeding places
  - Feeding space wide enough

Recommendations for keeping horned cattle (dairy cows)

- Feeding area
  - Understocking of feeding places
  - Feeding space wide enough

  - **Appropriate type of feeding barriers (open at the top)**
  - Self-locking feeding barrier
  - Neck rail feed barrier only with ad libitum feeding



Recommendations for keeping horned cattle (dairy cows)

- Feeding area
  - **Concentrate feeders protected**
  - **CF appropriate design**

  - Sufficient number of water troughs
  - Water bowls at feeding place
  - Additional hay rack

Recommendations for keeping horned cattle (dairy cows)

- Milking parlour
  - Tandem milking parlour is preferable
  - Separations in head zone in a herringbone parlour
  - Milking parlour design appropriate
  - Waiting area large enough

Recommendations for keeping horned cattle (dairy cows)

- Further aspects
  - Brushes
  - Enlarge feeding space for bull in herd

Recommendations for keeping horned cattle (dairy cows)

- **Recommended** dimensions for dairy cows

Feeding place width (per animal)	85 cm
Animal/feeding-place ratio	1:1,1
Animal/water troughs ratio	10:1
Alley width behind feeding place	4.5 – 5 m
Alley width between cubicles	4 m
Crossover with water trough	3 m
Cubicle length	3 m / 2.70 m
Animal/cubicle ratio	1:1.1 – 1.2
Lying area per animal	8 m²
Outdoor run	2 – 4.5 m²

Based on experiences, few scientific evidence

Recommendations for keeping horned cattle (dairy cows)

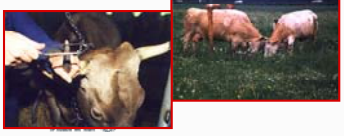
- Management - feeding management
  - High quality food always available
  - Adapted duration of fixating cows in the feeding place
  - **Immediate repair of broken feeding barriers**
  - Pay attention to supplement feeding
  - Feeding after milking
  - No concentrate feeding in the milking parlour

Recommendations for keeping horned cattle (dairy cows)

- Management - social behaviour, herd structure and individual animals
  - Selection against aggressive animals
  - Select carefully the bull running with the herd
  - Minimize separation of cows and regrouping as far as possible
  - Increase service life and reduce the replacement rate

Recommendations for keeping horned cattle (dairy cows)

- Management -social behaviour, herd structure and individual animals
  - Separation of cows in heat
  - Integrations of replacements in early age
  - Measures during integration of animals to reduce stress
  - **Rounding the tip of the horns**



Recommendations for keeping horned cattle

- Human-animal relationship
  - Good handling practices
  - Avoid negative interactions
  - Careful selection and education of staff
  - Constant care
  - Clear responsibilities
  - Sufficient time to observe animals

Recommendations for keeping horned cattle

- Additional aspects for beef suckler herds
  - Special areas for calves

- Additional aspects for young stock
  - Pens large enough – groups not too small
  - Housing of young stock in contact to the cow herd
  - Mixed-age groups with some regrouping during rearing

Recommendations for keeping horned cattle

- Additional aspects for fattening bulls
  - Keeping horned and hornless animals separately
  - Higher space allowance than usual

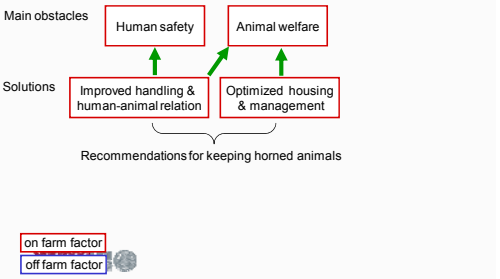
Recommendations for keeping horned cattle

- Additional aspects for transport / slaughter
  - No mixing of groups

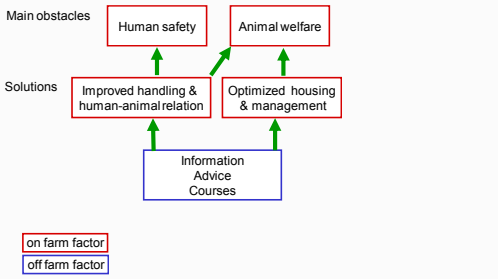
Improve human safety

- Major causes of accidents
  - fearful animals
  - startle reactions of the animals
  - lack of knowledge regarding appropriate handling
  - inaccurate human behaviour
  - inappropriate handling facilities and housing
- Major prevention factors
  - appropriate human behaviour
    - good handling practices, regular positive contact, avoid negative interaction
  - improved cattle-human relationship with low levels of fear of humans,
  - appropriate handling facilities and housing

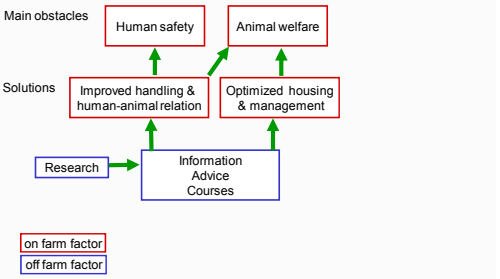
Keeping horned cattle: obstacles – solutions - advantages



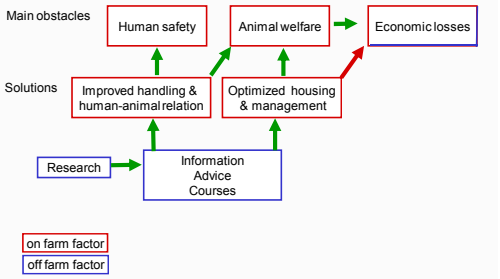
Keeping horned cattle: obstacles – solutions - advantages



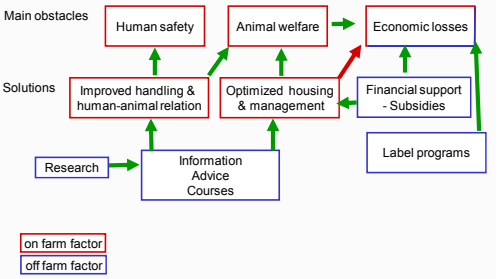
Keeping horned cattle: obstacles – solutions - advantages

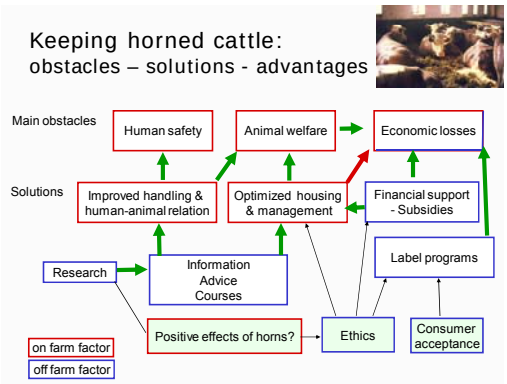


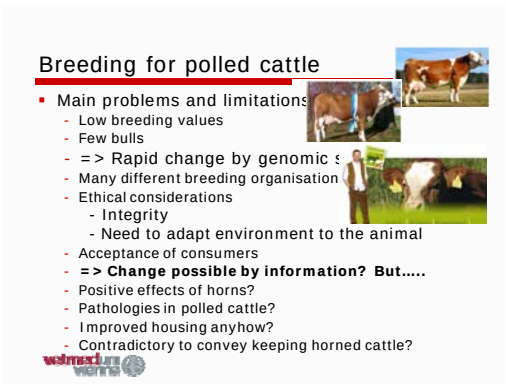
Keeping horned cattle: obstacles – solutions - advantages

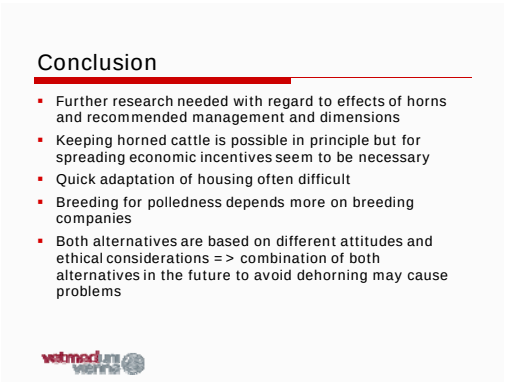


Keeping horned cattle: obstacles – solutions - advantages









Key points:

There are risks with horned animal (animal and human safety) but there are ways to manage these risks.

Recommendation to keep horned cattle:

Social behaviour: during establishment of hierarchy they use their horns during fight to better push the opponent with a good hold, to not glide off each others head.

There are agonistic interactions only when they enter in the opponent individual space, therefore:

→ is needed sufficient space

→ is needed sufficient resource to avoid competition

→ is needed to increase the stability of the group

→ it is possible to reduce the sharpness of horns

Also: selecting gates allows to separate animals during feeding and feed them differently according to milk yield. So they can stay in the same whole group for most of the time, avoiding regrouping during lactation

→ is needed spacious alleys, no dead end situations

→ outdoor run should be encourage (allow more space)

→ cubicles of sufficient dimension, with flight possibilities to the front

→ adapted feeding barriers (open on top)

It is also possible to select less aggressive animals

It is also important to separate cows in heat

All this can work if farmers or other people are ready to invest in the observation of animals and if they are convinced it can work

Economic costs: building are more expensive → need to differentiate the products / production systems (label or subsidies)

Further research is needed for assessing effects of horns and determining management/space requirements for horned animals

Conclusions:

1. Keeping horned animals is possible
2. Polled animals depends on breeding companies
3. Ethical attitude: Naturality? Welfare?

13 Comments and questions considered during the discussion (Chair: Isabelle Veissier, INRA)

1. It was clarified that sometimes animals from different owners are mixed in communal areas and that the consequences of this mixing can be very bad if animals from one owner are disbudded and the others not (producer).
2. If e-learning material is developed, it should be in other languages, and not only in English (producer).
3. If you are encouraging changes... What about the economic point of view? More space, different facilities... is that feasible? We need to be very flexible with dairy and meat industry for being competitive (scientific and producers).
4. Although I think disbudding is better than dehorning, sometimes animals are born in the field and when they are recovered they are too old for disbudding, then dehorning must be applied. Only the last part of the horn is removed (producer).
5. The assessment of the wounds on the body of animals allows to distinguish if they have as a cause a fight between animals or problems in the facilities, transport... (scientist)
6. What is happening with goats? (vet)
    - 6.1 Most of the recommendations given by cattle can be also useful for goats (scientist)
    - 6.2 It is not possible to apply local anaesthesia in goats, so, general anaesthesia should be applied (vet)?
    - 6.3 It is possible to remove the last 1/3 of the horn without anaesthesia because it has no nerves (vet).
    - 6.4 Problems in using polled goats due to infertility problems associated (freemartins; scientist)
7. Horned animals:
    - 7.1 YES, but first at all, good information is needed (scientist).
    - 7.2 YES, but based in housing systems that reduce possible problems (more problems in loose housing conditions than in tied stalls) (producer).
    - 7.3 NO, I'm not agree in the fact that animals have less painful contacts with other animals than dehorned ones (producer).
    - 7.4 NO, I don't think that a horned cow is happier than a dehorned cow (scientist)
    - 7.5 NO, Horns are not only a problem for farmers, but also for the slaughterhouses (the industry is against horned animals), (meat industry)
    - 7.6 NO, the meat industry is losing more money with horns than without (meat industry)
    - 7.7 YES, some industries pay more for horned animals than dehorned (scientist)
    - 7.8 NO, eg. I had a farm with horned animals and when they had to make groups for applying vaccinations or other practices, there were damaged animals, lameness, etc... Now, they are working with dehorned animals (producers).

7.9 YES, Most of the times, when you have problems with horned animals (due to facilities...) they are also there in case of dehorned animals (scientist)

8. Polled animals:
    8.1 I don't think that genetic selection could be a solution for a animal welfare problem (NGO's)
    8.2 If the genetic selection is well defined is not a problem (scientist)
    8.3 Problems with polled animals are that they come from few animals, so a problem of inbreeding must be considered. Especially if we don't make a good breeding program to carry out that (scientist).
9. What about the caustic paste use for disbudding?
    9.1 The problem with caustic paste is not the system by itself, but the consequences. Risk to burn other animals or risk of "dripping" if animals go under the rain. However, probably is less stressful than other methods as hot iron (based on cortisol levels), (scientist)
    9.2 The use of caustic paste+xylazine could be a good alternative (scientist)
    9.3 Xylazine doesn't work in presence of the caustic paste (scientist)
    9.4 Pain appears more slowly but may last longer (scientist)
    9.5 The problem when hot iron and caustic paste are compared when disbudding is that they are different types of pain (scientist)
    9.6 More research is needed to give recommendations in the use of caustic paste, especially in the long term
10. What about freezing as a method for disbudding?
    10.1 Nowadays is just under study (scientist)

Ethical issues:

1. Integrity and naturalness of animals must be taken into account and maintain horned animals (scientist)
2. It is necessary to eat less meat and to have more grassland that will provide space enough. The future is to have less cattle and in a better state for meat production. The milk production is a problem of the society (NGO's).

Recommendations:

1. First at all, good information
2. Farmers with horned animals needs a good advice
3. It is necessary to have good protocols to carry out disbudding and training courses for farmers
4. The industry is agree in doing disbudding/dehorning only with anaesthesia + NSAIDS (general agreement in this point)

14 Concluding remarks and recommendations (Chair: Luc Mirabito, Subproject leader, IE)

Two groups of strategies could be summarised

1. **Improve the practices in farms**, probably doing disbudding (the more welfare friendly system for animals), but by means of:
   - **1.1** Training courses
   - **1.2** Good practices guidelines
   - **1.3** Forms of monitoring the practices
   - **1.4** Development of protocols for local anaesthesia + analgesia

2. **Long term strategy:**
   - **2.1 Polled cattle**
     - **2.1.1** Artificial insemination
     - **2.1.2** Problems of inbreeding
     - **2.1.3** Problems with the consumer view
     - **2.1.4** Animals are modified
     - **2.1.5** Resistance for local breeds
   - **2.2 Horned cattle**
     - **2.2.1** Systems must be improved
     - **2.2.2** For farmers who are ready, with advice and training
     - **2.2.3** An agreement between all the stakeholders is needed

DG-Sanco (**Jostein Dragset)**:

- Agrees with conclusions.
- Dehorning has to be considered with all other parts of the animals' life.
- If there is a legislative proposal by the EU commission then there will be an assessment of the economic impact.

Appendix 1. Participants list

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