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Investigating human-animal interactions from the animal's perspective

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► **To cite this version:**

Xavier Boivin. Investigating human-animal interactions from the animal's perspective. Seminaire SRUC, Jun 2013, Roslin, United Kingdom. 43 p. hal-02803865


HAL Id: hal-02803865

<https://hal.inrae.fr/hal-02803865v1>

Submitted on 5 Jun 2020

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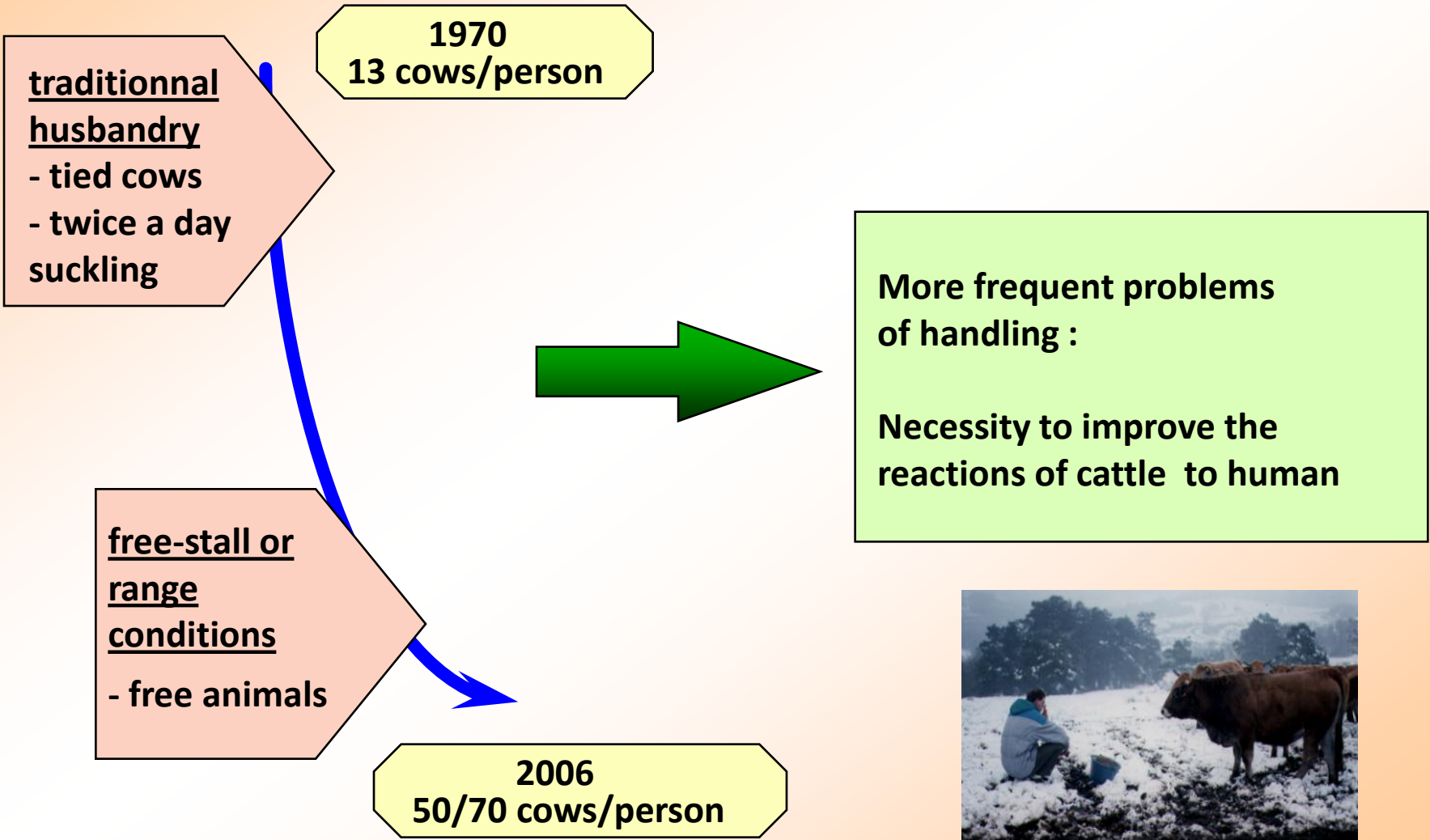


Investigating human-animal interactions from the animal's perspective

(X. Boivin, UMR1213 Herbivores, INRA Theix)



Evolution of the French modern beef cattle husbandry



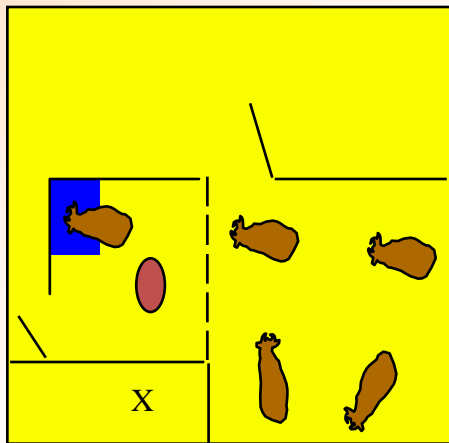
Test of docilité





Docility can be defined as the ability of an animal to accept the constraint imposed directly by the human (forced proximity, contact, driving)

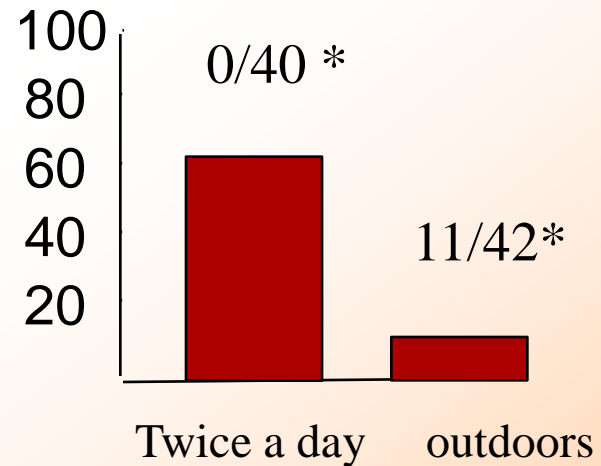
(Boivin et al, 1992, 1994, Le Neindre et al, 1995)

Docility test : Comparaision between twice a day suckling system and outdoors system for beef cattle



-  animal
-  human
- X observer
-  Restrain zone

% of restrained animals



(*) proportion of aggressive animals at 8 month of age

(Boivin et al., 1994, 1998)

PowerDirector Version d'évaluation



PowerDirector Version d'évaluation



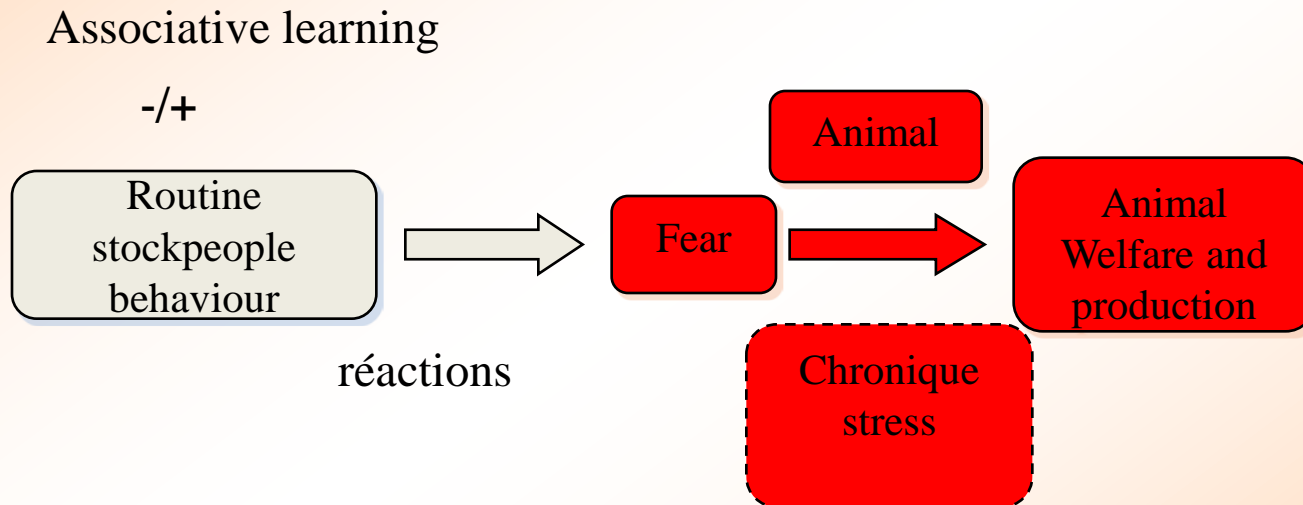
Human-animal relationship

Theoretical framework and research strategy



A theoretical framework

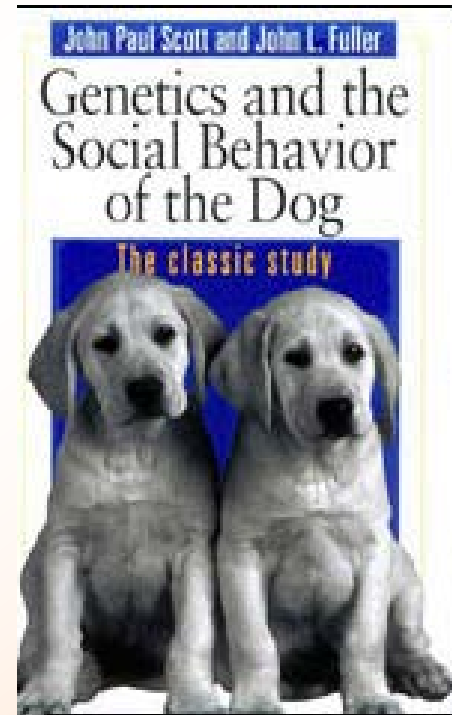
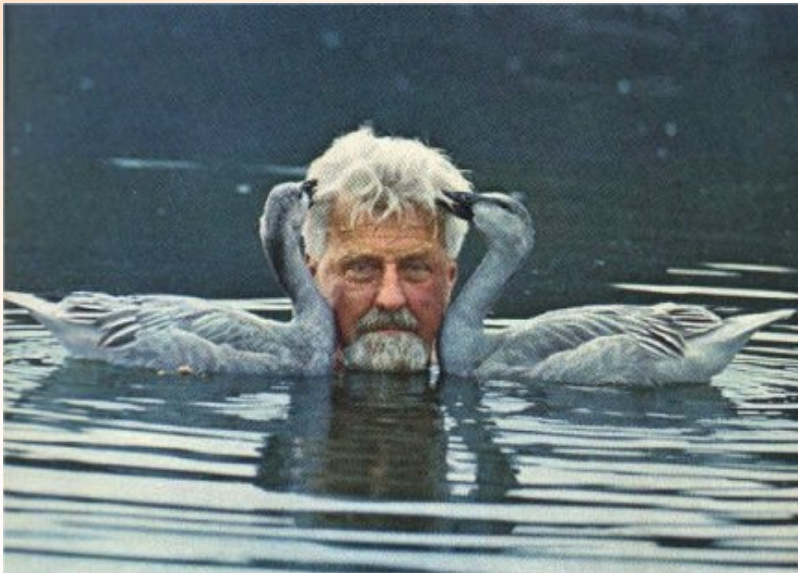
Paul Hemsworth's work in pigs and dairy cows production



The standard human approach test

A theoretical framework

The importance of the human-animal interactions in early age and the concept of « socialisation »



Lorenz and the geese (1935), Scott and the dogs (1962)
The concept of sensitive period of contact

The « socialisation » concept



A social relationship (including the human) is mainly based on an attachment and adjustment to the other members of the group during sensitive periods of animal life (Scott, 1972, 1992)

====> practical interest for the farmer: efficient, quick and durable

Probleme of definition for the human-animal relationship

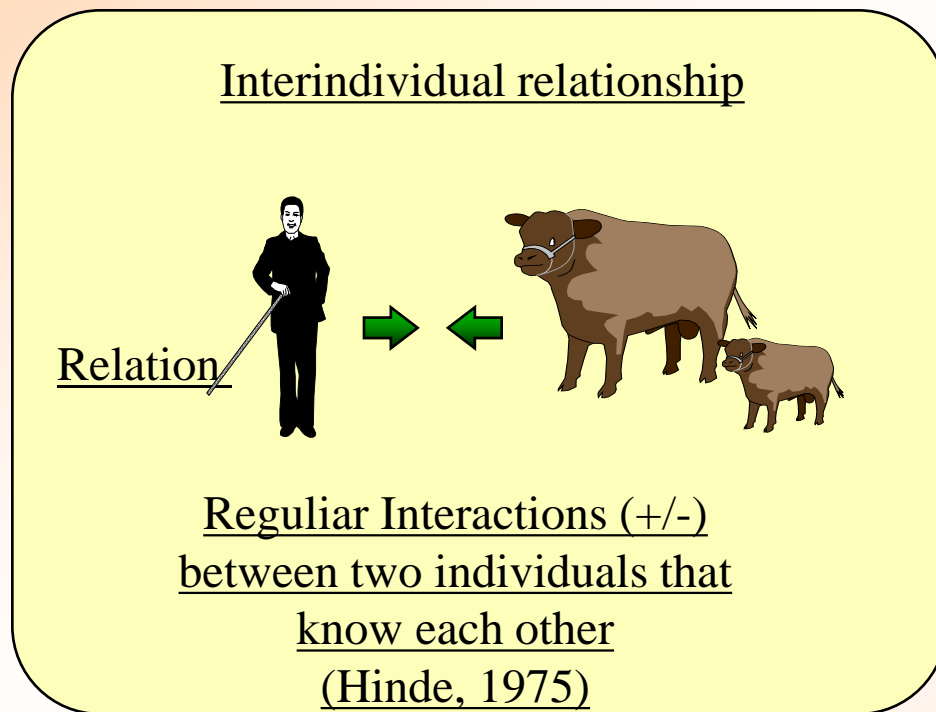
Social group : mutual attraction between individuals from the same species outside periods of reproduction (Chauvin, 1963, Wilson, 1975)

Sociality concept based on species evolution (genetic basis) and their behaviour

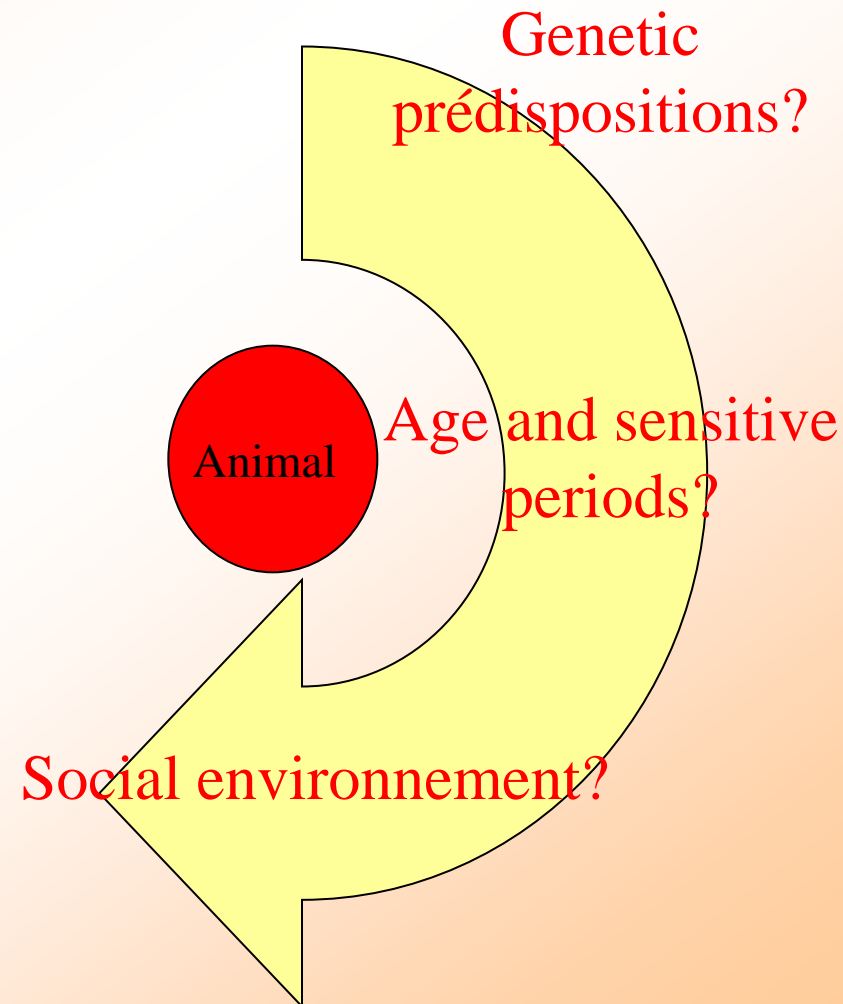
Overlap between communication systems of humans and animals (Hediger 1965, Estep et Hetts, 1992, Montagner et al, 1995)



A theoretical framework (inspired by Estep et Hetts, 1992)



Quality? Discrimination/
généralisation



Existence of a genetic variability?

Projet ANR Critère et Objectifs de Sélection Animale pour un Développement Durable (COSADD) Post Doc H. Benhajali



In bull testing station



Docilité test

(Le Neindre et al, 1995,
Phocas et al, 2006)

On farm



Crush test

Mvt weighing
Mvt 10s human



Approach test

Benhajali et al, 2010

Heritabilities: 0,2~0,3

Genetic corrélations of the evaluation on farm and on bull testing station

Tests on farm

Docility test

	Total mvts pesée	Total mvts 10s	Score Pointage
Running time	+++	+++	+
Restraint time	---	--	~ 0
Escape attempts	+++	+	~ 0
Attack	+	-	~ 0

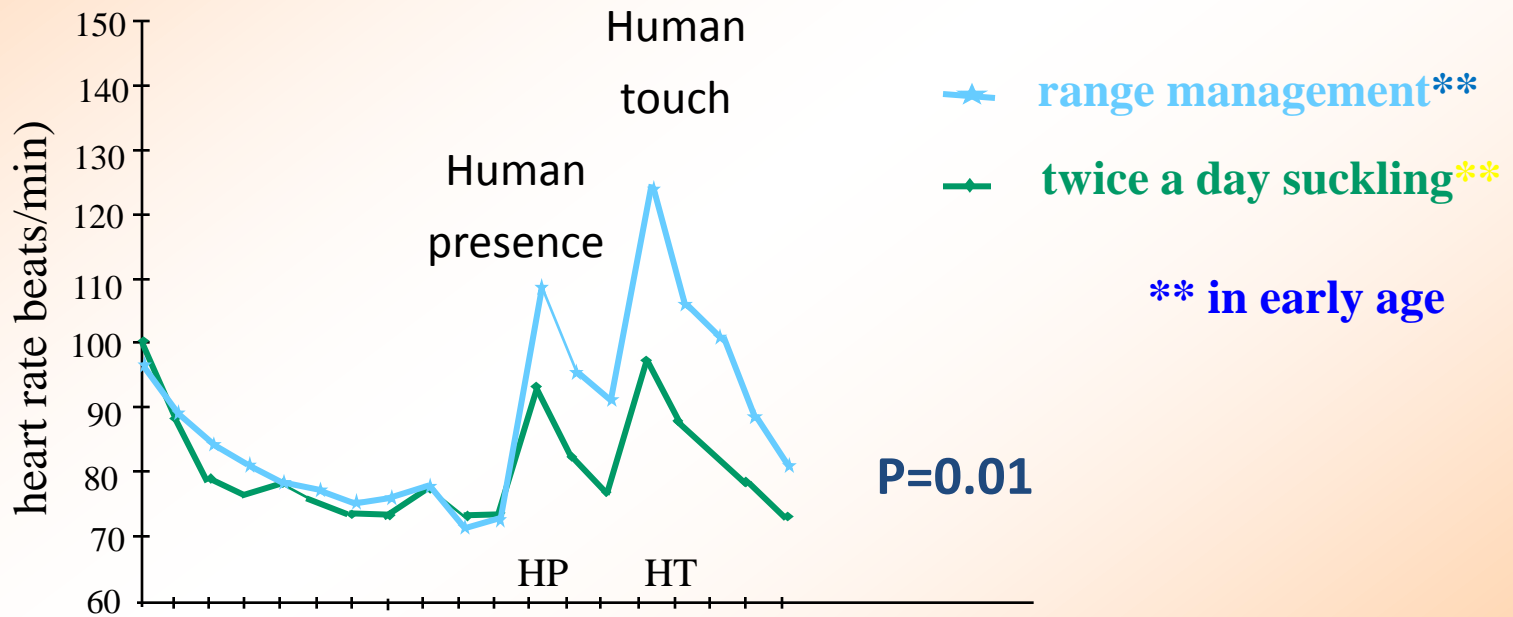
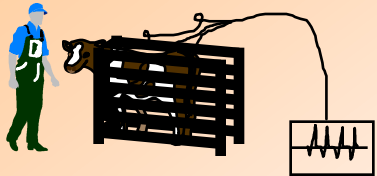


What about sensitive periods to human contact in farm herbivores?

- In early age
- At weaning
- après la mise-bas



Fear of people depends on husbandry systems (e.g. beef cattle in a crush at 20 months of age)



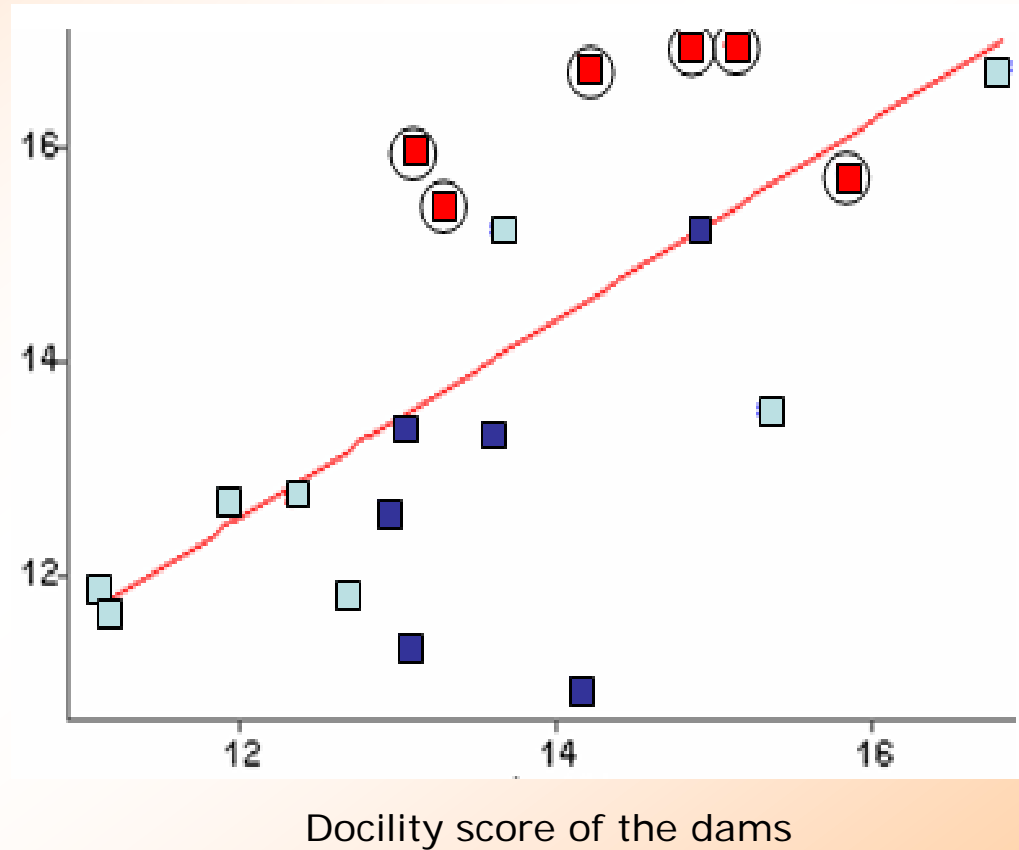
Recording of the heart rate

Is the social environment modifying the efficiency of the human contact provides in early age?



Fearful beef cows have fearful calves despite early handling

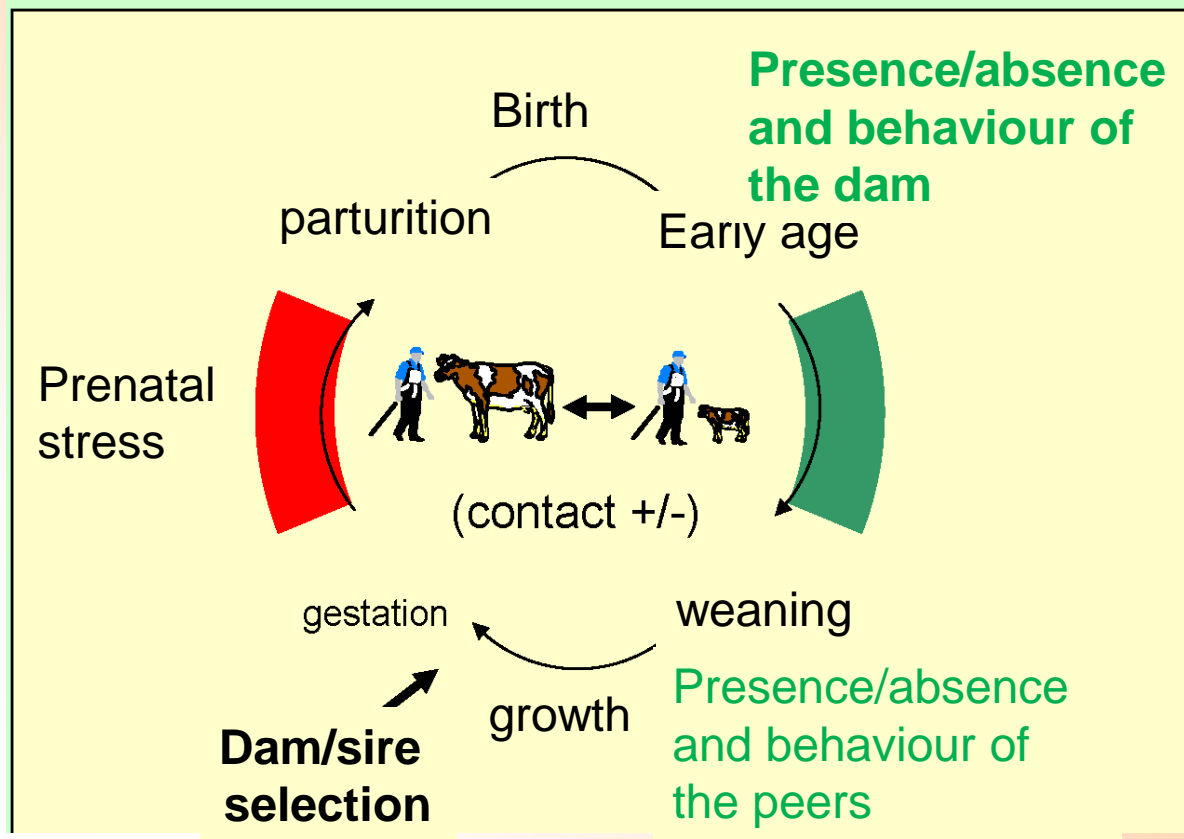
Docility score of the calves (5 months)



* Salers calves stroked in early age

(UE domaine INRA des Monts Dorés, Boivin et al, 2009)

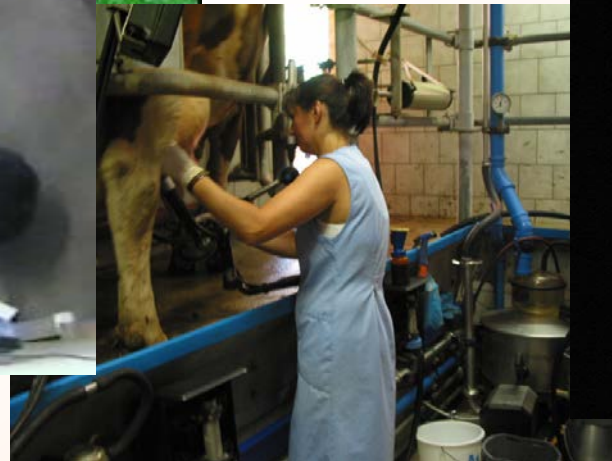
A vertuous cycle for improving the farm herbivores-humans relationship



(pour revue Hemsworth et Boivin, 2011)

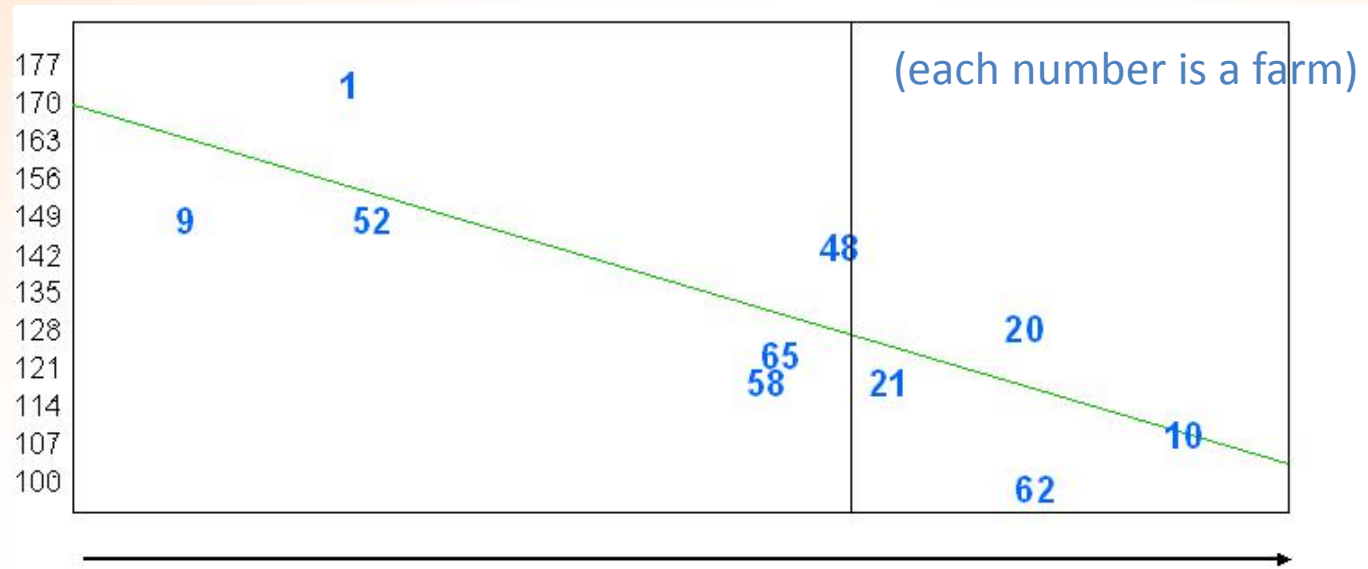
Touching/stroking farm mammals during human-animal interactions: what does it mean for them?

INRA UMRH Theix, INRA PRC Tours, Univ. Vet Vienna



Contact with the calves (from farmers' statement) / dairy cows behaviour

- Median flight distance of adult cows per farm (cm)



« I do not give particular contact to my calves »

« I give many additional contact to my calves »

Evaluation of an affective bond between young herbivores and their human caregiver

(in relation to the attachment theory: Bolby, Ainsworth; pour revue Cassidy et al, 2010)

(« an internal working model » in its relationship with the other)

- Reunion/separation with the familiar caregiver
- Preference for the familiar caregiver?
- The caregiver as a security basis?



Test of social isolation/réunion/séparation

(Inspired from Bolby, Ainsworth, for revue Cassidy, 2010)

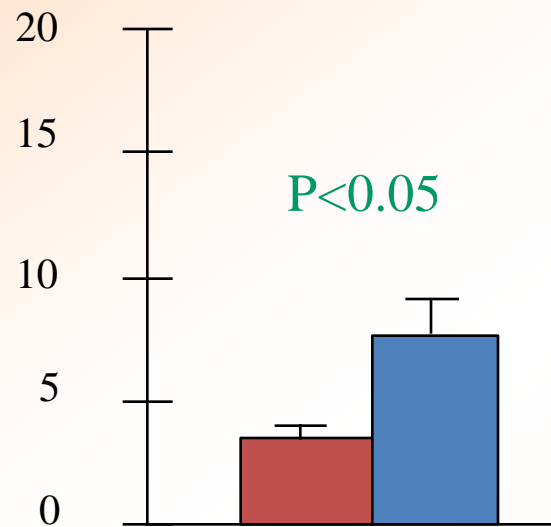
Apaisement with
the caregiver?

Distress of separation?

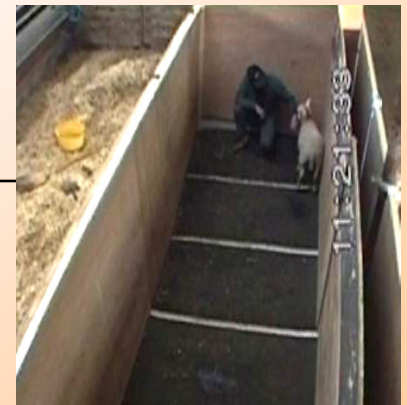
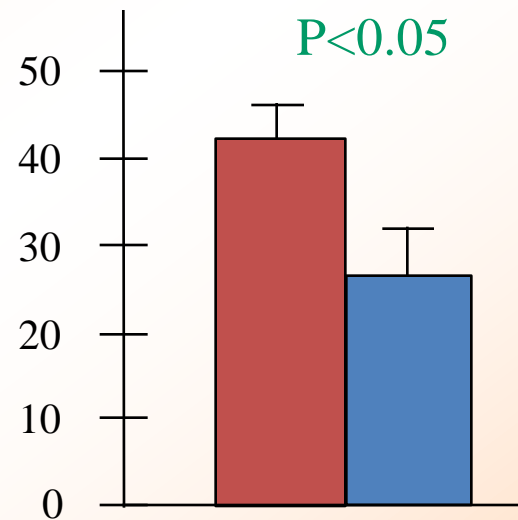


Préférence for the familiar caregiver in artificially reared lambs?

vocalisations



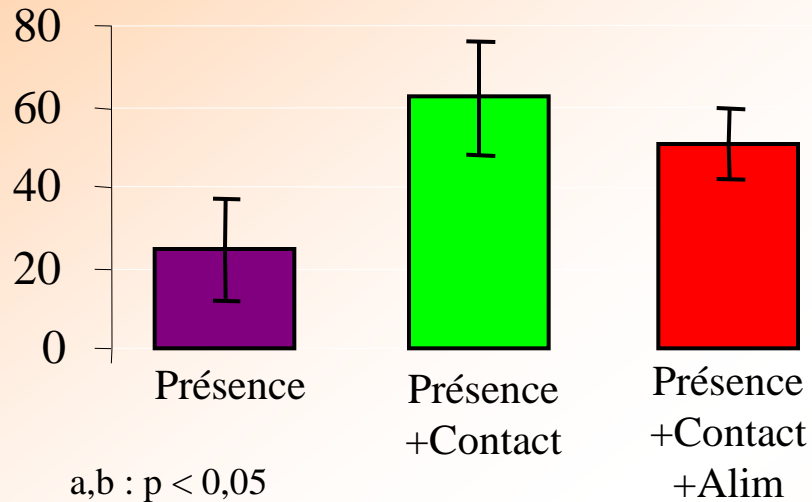
durée d'interactions (s)



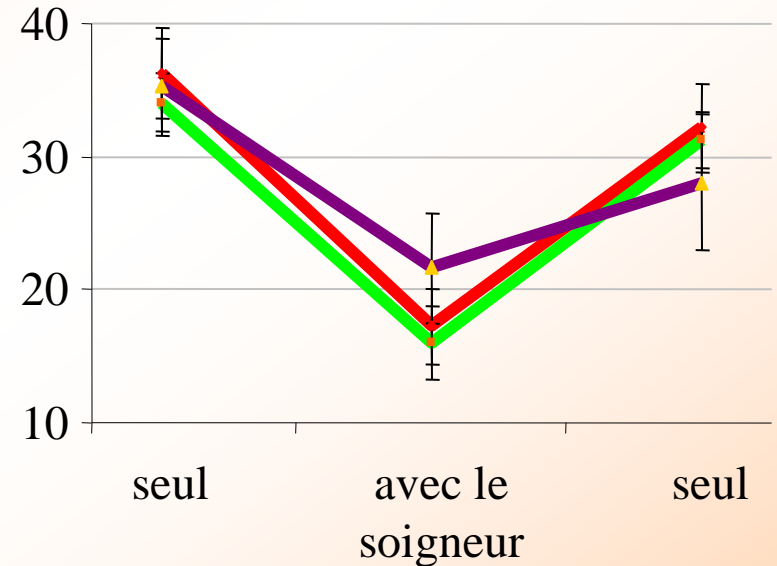
(Boivin et al., JAS 1998)

Duration of contact and vocalisations

Temps passé près du soigneur (sec)



Evolution des vocalisations



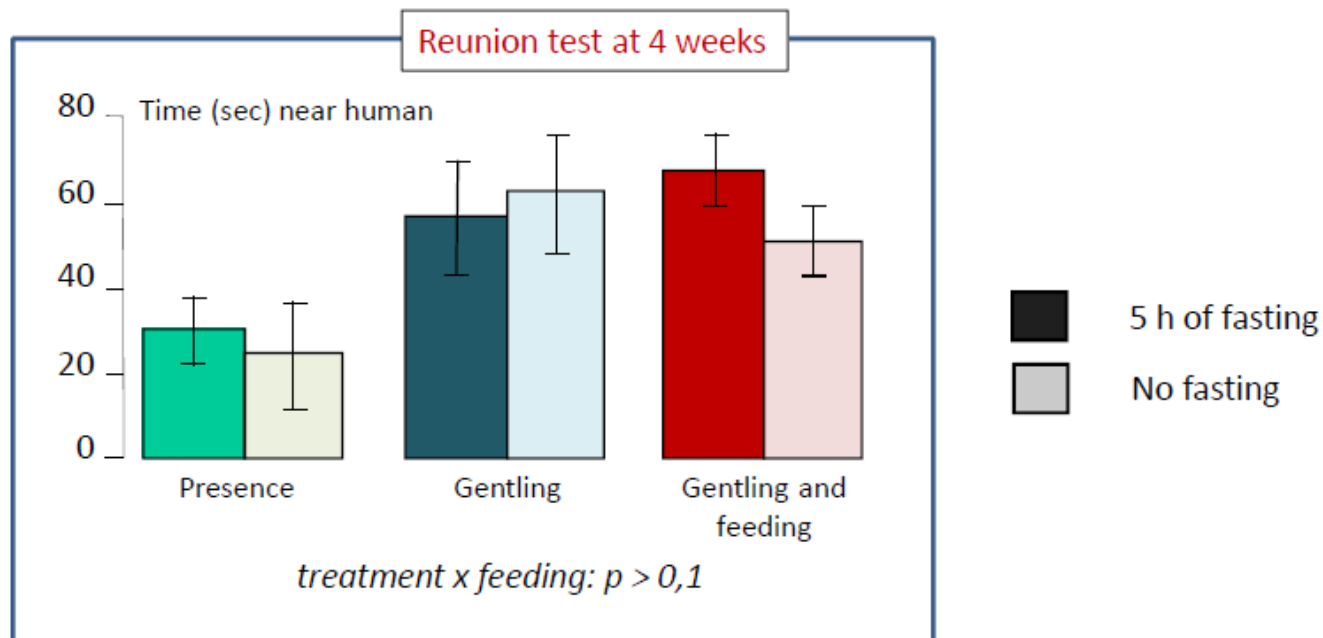
traitement x phase : p < 0,05

* 3x3 min/jour pour 5 jours dés l'âge de 24 h
puis 2 fois/semaine

Tallet et al, AABS 2005

- * contacts favorisent affinité en isolement
- * pas d'effet additionnel de l'alimentation

Importance of feeding and gentling



Attraction for the human regarding feeding time (Tallet et al Dev. Psycho. 2008)

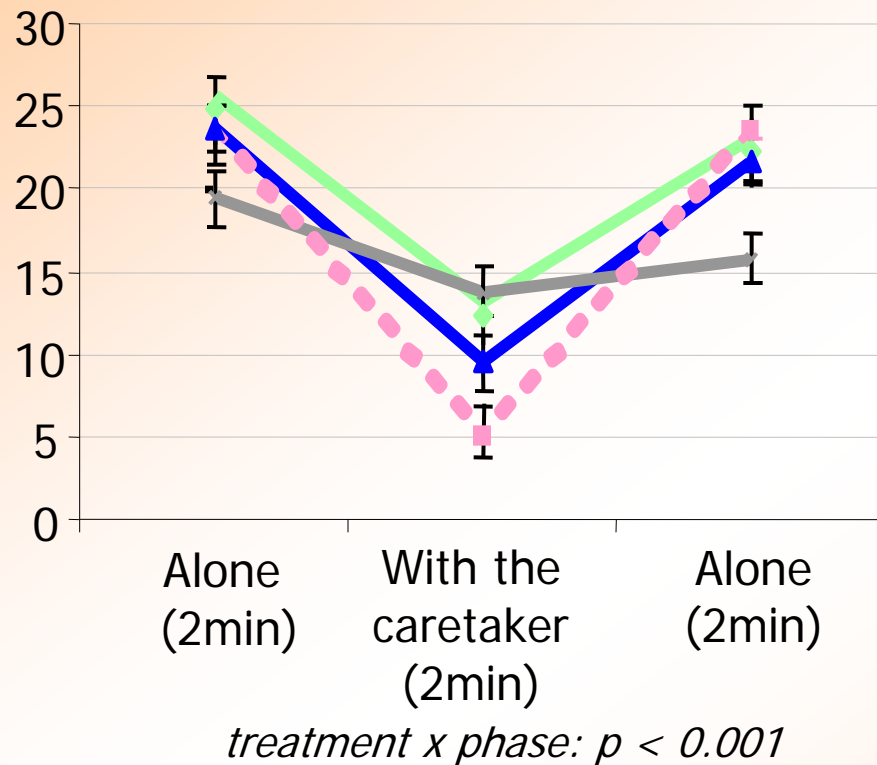


Percentage of contacts with the familiar person

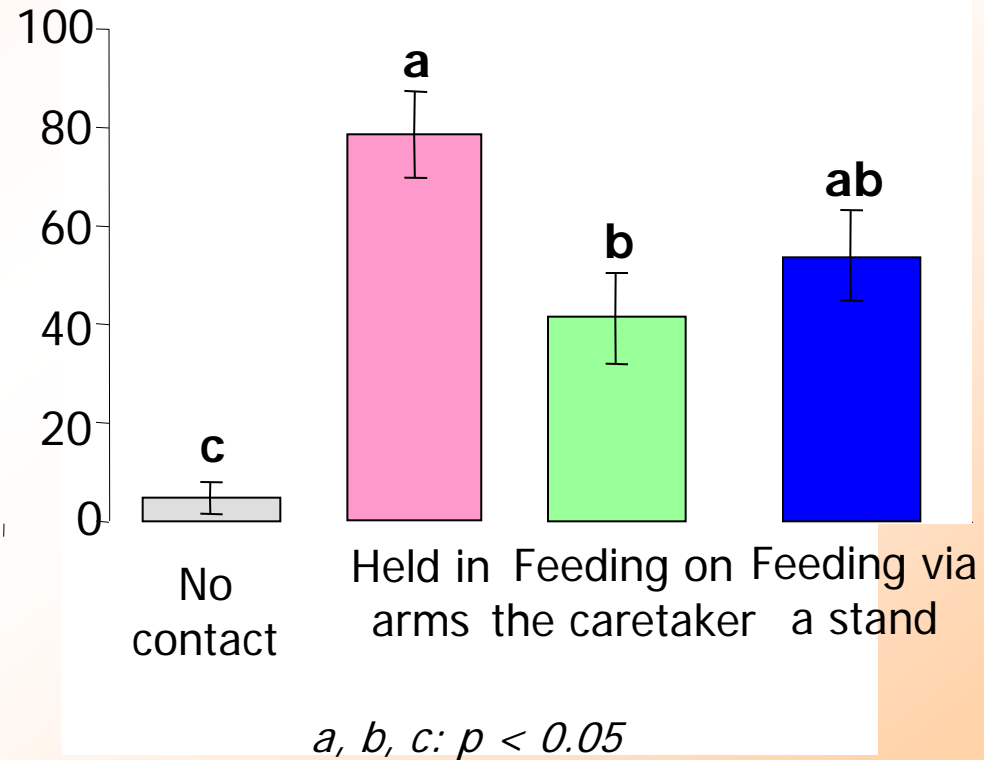


Lamb's behaviour in social isolation in a test pen

- Evolution of vocalisations



- Lambs' attraction to the caretaker (s)

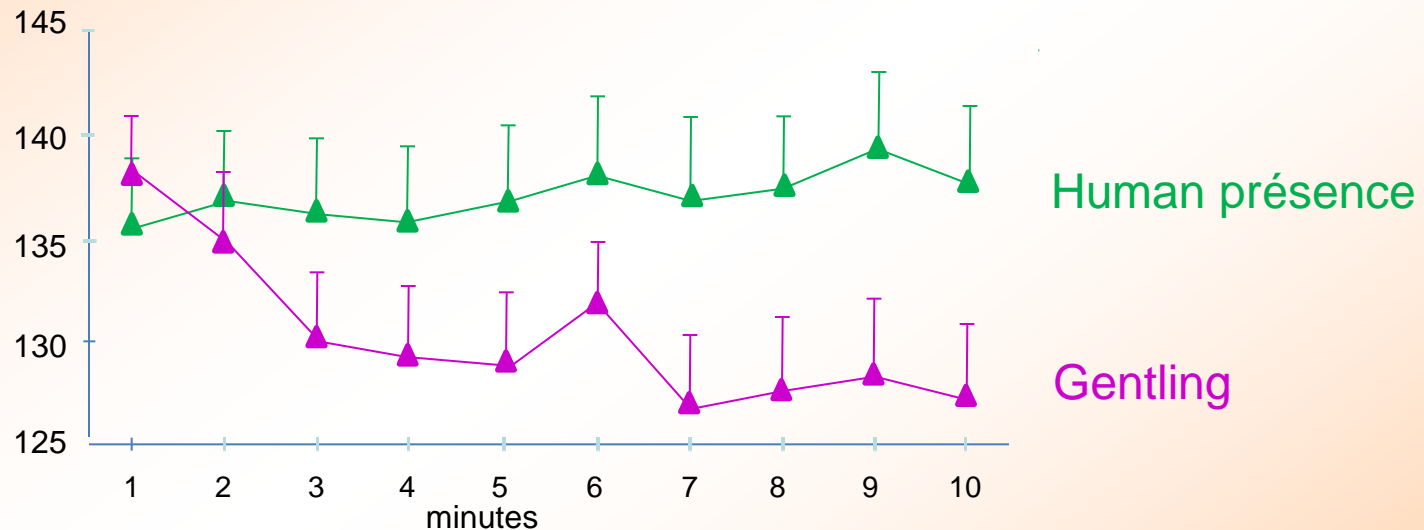


Four weeks of human contact
(3x5 min/day) since one day of age

Gentling young herbivores for appeasing them? Anthropomorphism or real interest for the animals?

- objective
 - Perception of the human presence and the tactile contact (animals not used to such contact)

Heart rate (Batt/min)



(HILD et al, IEC 2013)

Towards a transdisciplinary approach including collaboration between animal behavioural science, animal physiology and genetic

The lambs is a very good experimental model :

Strong and robust behavioural responses despite physiological sampling (Projet ANR BOND007)

Running divergent selection in the Roman breed in their social response and towards humans (Boissy et al, 2005, Ligout et al, 2011 Caroprese et al, 2012)

→ possibility to work on
genotypexenvironnement interaction



Towards a transdisciplinary approach including collaboration between animal behavioural science, animal physiology and genetic

-Behavioural responses

(approach, reduction of agitation and vocalisation, ears position, relaxation posture, exploration basis...)

- Physiological responses

(cortisol, oxytocin, heart rate variability, immune response...)

(référence to the concept of affective relationships and attachment. For review, Kraemer, 1992, Uvnas-Moberg, 1997, Carter, 1998, Cassidy, 2010) and the research work on positive emotions in the team (Waiblinger et al, 2007, Boissy et al, 2007)

(Coulon et al, PNEC 2013)

Transport to the abattoir

Multiple regression analysis % of variability explained by the different factors

Cortisol in bleeding
(Stress at slaughtering)

	β	R ²	P
- Duration of transports	0,02	2.1	0,005
- Familiarity of the groupe during transport	-0,3	4.0	0,0001
- Belief that bulls are sensitive to human contact	-1	9.6	<0,0001

(Mounier et al, Animal 2007)

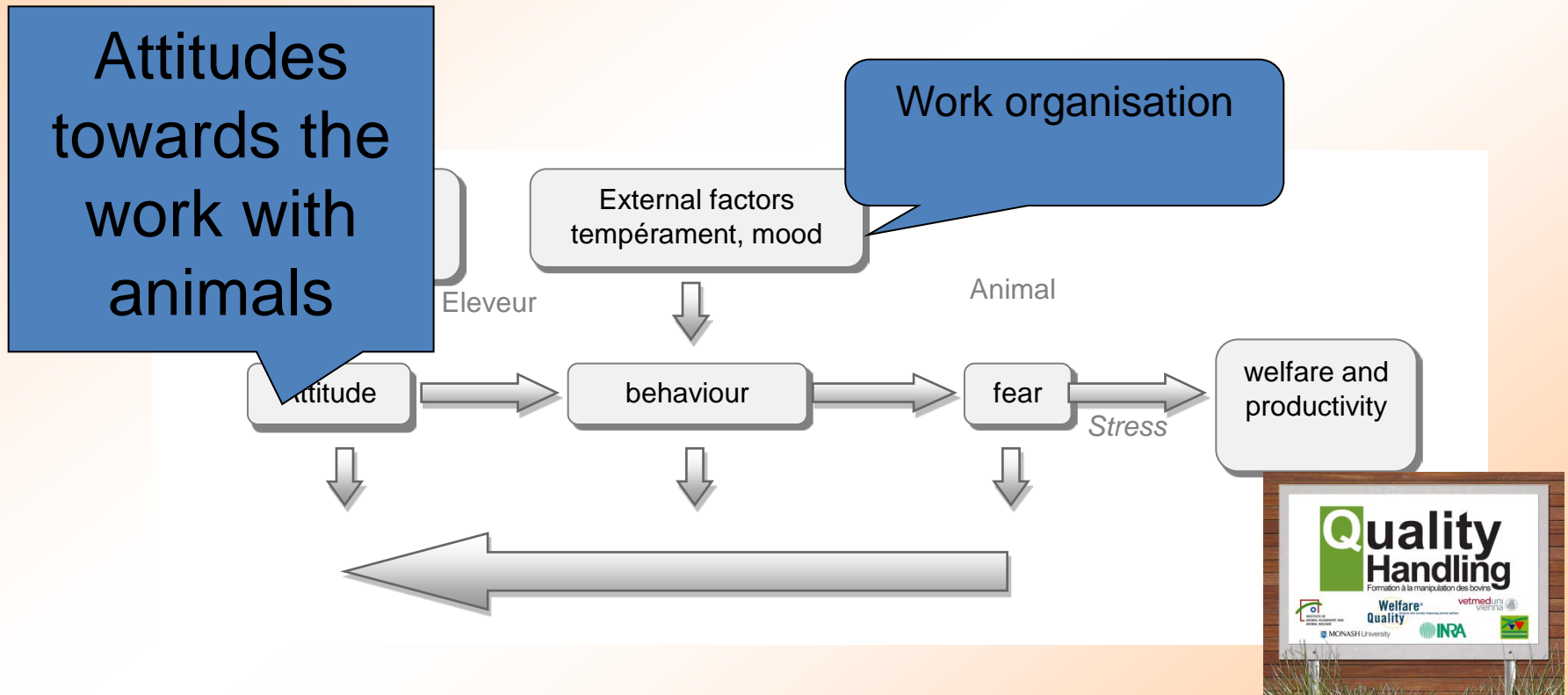
Transport to the abattoir

Multiple regression analysis
% of variability explained by the different factors

difficulties of loading in the truck
(synthetic variable)

	β	R^2	P
- Appropriate handling facilities (cattle race, loading place)	-1,47	40,3	<0.0001
- bulls mixed during fattening	0,41	0,7	0,02
- Familiar group during transport	-0,02	0,9	0,01
- farmer's positive attitudes towards contact with the bulls	0,08	6,7	<0.0001

What bring psychology, sociology and ergonomics in our understanding on the Human-farm animal relationship



(Boivin et al, INRA productions animales sur le travail en élevage2012)

Attitudes of the farmers towards animals and their work with animals

(Kling et al, 2003, Boivin et al, 2013 for review)

Farm animals? A working companion (Lamine, 2006) → a **professional relationship** (Kling, 2003, Porcher 2010)

- The instrumentalised animal
- The communicative animal
- The affectional animals

→ Different visions of the job, different level of interest in the job

→ Different types of behaviour towards the animals
(Dockes et Kling, 2007)

Farmers' logics and work organisation (Le Guen, 2006)

« Contact with my calves at weaning, I would like too but I have no time for it anymore »

Logic of work: **choice of a farmer for combining**
professionnal ambitions and way of life

Looking for the lost time...

FERME PRÉS VERTS Soigneur robotisé DEC 307



« On a choisi le DEC de Rovibec pour l'économie de temps et pour sa très bonne réputation! »

Luc Deschênes, Gaëtan Deschênes et Dominique Sirols
St-Gabriel de Rimouski, QC
TROUPEAU: 33 VACHES · MOYENNE: 12 078 KG

OBJECTIFS DE LA FERME PRÉS VERTS

- Sauver du temps
- Maintenir un niveau élevé d'efficacité

MOYENS UTILISÉS

- Introduction du DEC 307 (distributeur de RTM et de concentrés, sans mélangeur intégré)

RESULTATS OBTENUS

- Économie de temps: 2¼ heures par jour
- Délai de récupération du système = 4,8 années (installation et équipements INCLUS)



Working differently

The 5 rationalities in farmers' attitude towards work

(Fioreli, Porcher, Dedieu, INRA Productions animales 2009)

- **Économics**
- **technical**
- **Search for identity**
- **relative to the body engagement during work (outside/inside, rythms of life...)**
- **Relational (chosen colleagues, animals)**

Trans disciplinary projects to improve farmers training

Referring to the concept of husbandry practices,... the relationnal practices?

Husbandry pratiques :

Strategies including choices and technical actions depending on the farmer's objectives.

(Landais et al, Cah. Sci. Hum. 23 (3-4) 1937: 421-437).

Relationnal Practices :

Strategies targeting to improve the work with animals and reduce their stress for improving production and welfare (Boivin et al, INRA Productions animales 2012).

Transdisciplinary projects to improve farmers' training or decision making

Studying the relationnal practices in the different production systems

- **Do they exist and how to evaluate them?**
- **What is their variability with the transforming systems (milking robot, mechanisation, change in housing...)?**
- **What factors impact them (herd size, breed, farmers characteristics such age...)?**

Transdisciplinary projects to improve farmers' training or decision making

Studying the relationnal practices in the different production systems

- **How are they included in the general working organisation?**
- **What real consequence of these practices (production, work satisfaction and safety, animal health and welfare)?**

Many thanks for your attention



Crédits photo (X. Boivin, J. Lensink, C. Maitre, M. Ruis)