UMR1213 Herbivores

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JOUR / MOIS / ANNEE

UMR1213 Herbivores

- Largest French (European ?) research unit on herbivores:
  140 staff members, half are scientists
- Joint unit between Inra and VetAgro Sup
- Research focused on
  - cattle and sheep (goats) x dairy and beef
  - biology of herbivores: genomics, metabolism, products quality, digestion, behaviour
  - systemic approach: farming systems, modelling (incl. modelling of biol. functions)

Our missions and Values

Our missions

- To produce academic and applied knowledge
- To adress societal concerns
- To provide decision aid tools
- To train young scientists and technicians

Our values

- External : Independance, scientific rigour, acceptance of risks
- Internal : Solidarity, transparency, conviviality

Farming

Proteins for humans

Pollutions : N, CH4…
Use of land,
Poor animal welfare…

World population

Resources are decreasing

Global warming

Need for efficient farming systems
(to optimise production /
use of ressources – impacts)

Need to keep animals at their optimum while ensuring product quality and welfare

Objectives of our researches

- To design sustainable & adaptable farming practices and systems
- To assess
  - the economic viability of milk and meat production (specially under quality labels and in semi-mountain areas),
  - the quality of forages
  - the environmental footprint of herbivores (biodiversity of pasture, wastes)
  - animal product qualities
  - animal welfare
- To elucidate the underlying mechanisms (behaviour, nutrition, physiology…)

UMR1213 Herbivores: Teams

- 7 research teams
  - behaviour (2): welfare (ACS), foraging (Rapa)
  - metabolism (2): mammary gland (AGL), muscle (Amuvi)
  - digestion (1 Dima), feeds (Rapa)
  - production system (2): efficiency (Sybel), economy (Egee)

- 2 support teams
  - Logistics team (administration, finances, edition)
  - Information technology team

Experimental facilities

20 km

UERT (Theix)
250 ha - 1000 animals
(sheep, beef & dairy cattle, goats)

analytical studies

Monts Dore:
500 ha
200 beef cattle
sheep

Monts d'Auvergne

Marcenat:
400 ha
200 dairy cattle

80 km

studies
on practices & systems

UMR1213 Herbivores: Scientific production

- 100 scientific papers per year
  (2/3 in exceptional or excellent journals)
- 400 h of lecture per year
- 150 communications at congresses
- 20 books from 2009 to 2013
- 6 current patents, 3 softwares, 4 protected databases
- 1 congress organised per year
  (2012: Symposium *Gut Microbiota: friend or foe? ; 2014: FAO networks; WAFL2014; JSMTV*)

+ 20 PhD students or postdocs hosted

Some results from the ACS team

2 main objectives

- Understanding animal welfare
- Improving animal welfare

Le stress émotionnel des bovins à l'abattage : Comprendre le point de vue de l'animal

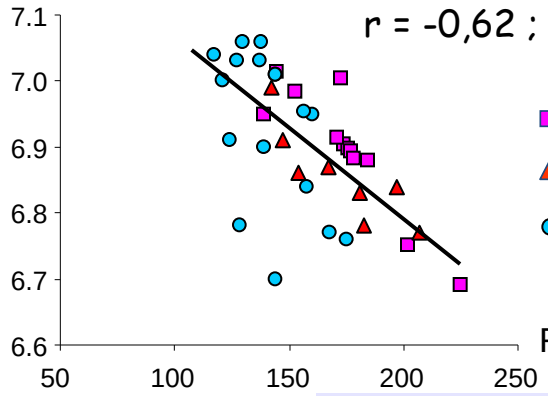
Chargement
Transport
Réception et Attente
Déchargement
Reprise
Étourdissement
Saignée

Perturbations sociales
Fatigue
Privation alimentaire
Nouveauté
Agressions
Présence de l'Homme
Douleurs
Environnement sonore

Phase d'engraissement : Evaluation de la réactivité émotionnelle
(test de soudaineté : ouverture rapide d'un parapluie)

Abattage : Mesure post-mortem du pH musculaire

pH musculaire
40min *pm*



r = -0,62 ; p = 0,0001

- Blond d'Aquitaine
- Limousin
- Angus

Réaction cardiaque à l'événement soudain (bpm)

Les animaux plus réactifs à la soudaineté sont plus réactifs à l'abattage (pH précoce plus faible)

Les événements soudains contribuent au stress à l'abattage

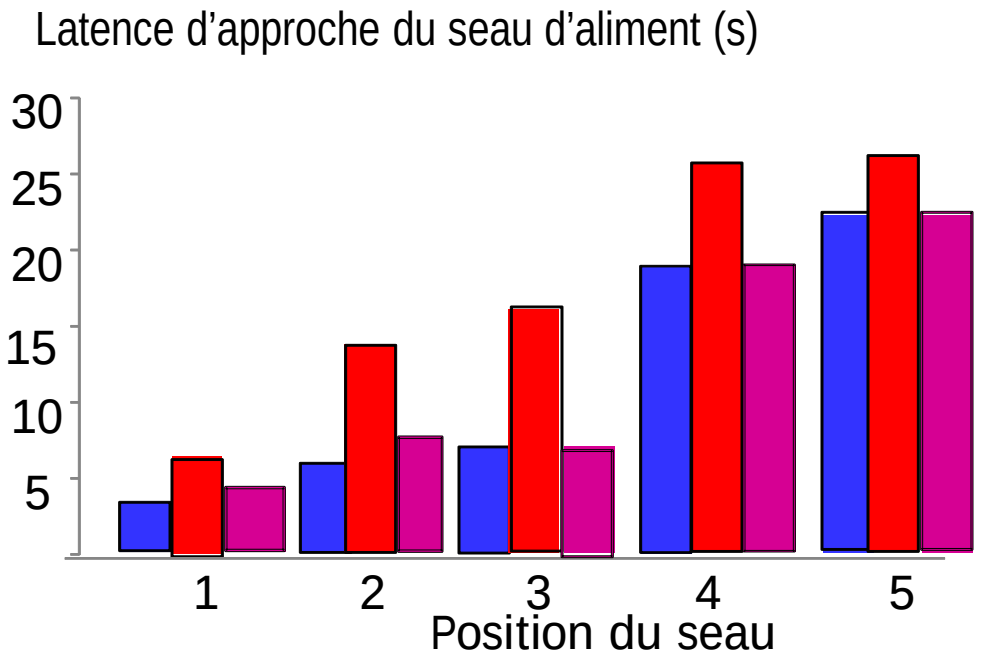
La réactivité émotionnelle évaluée en élevage est un indicateur de l'ampleur des réactions au stress d'abattage

Stress, pessimisme & bonne humeur des ovins

Témoins

1 mois d'événements désagréables, imprévisibles et incontrôlables → *stress*

Stress puis enrichissement du milieu



→ Le stress rend les moutons pessimistes

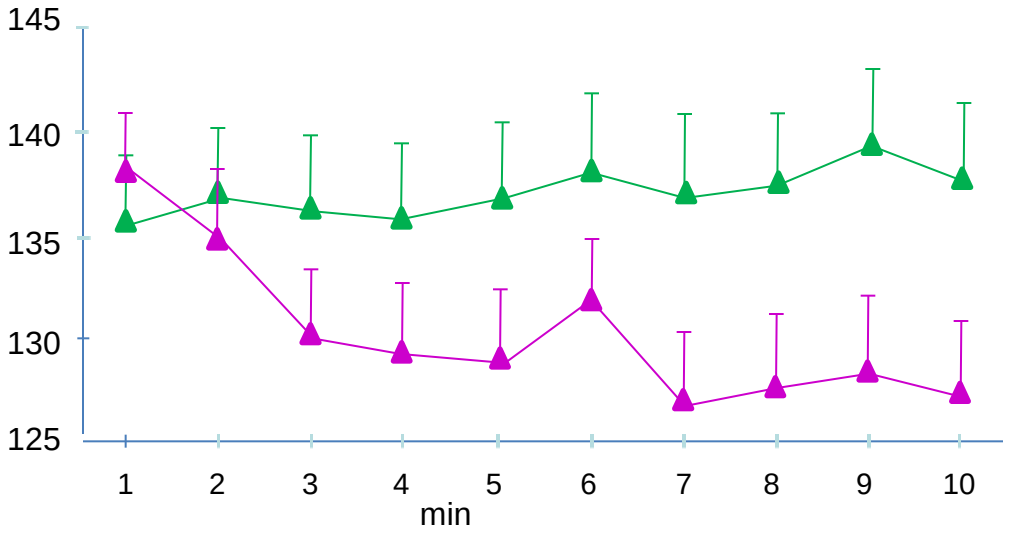
→ Des émotions positives corrigent le pessimisme

URH-ACS

Caresser les jeunes herbivores pour les apaiser : Sensiblerie humaine ou vrai intérêt en élevage?

- objectifs
  - Perception de la présence humaine et des contacts tactiles (animaux non habitué aux contacts tactiles)

Variation de la fréquence cardiaque (Batt/min)



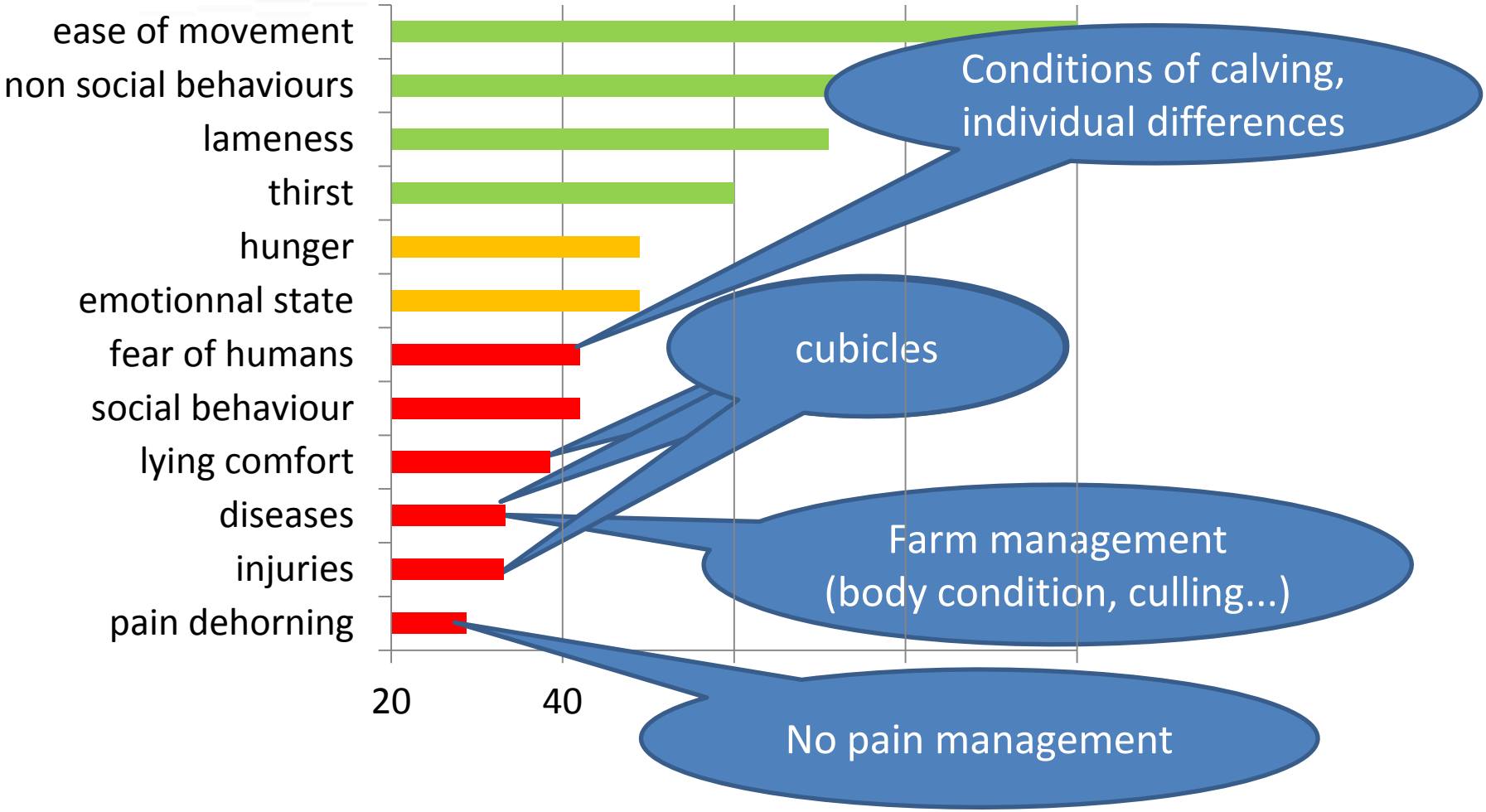
Test homme

Présence

Caresses

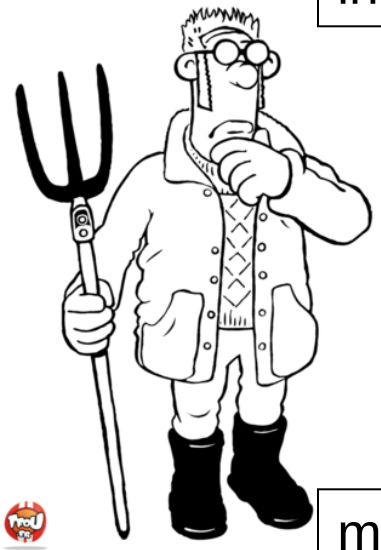
ANR Bond (2009-13)
- INRA Nouzilly
- Agro Rennes

The welfare of dairy cows under scrutiny



Under development: Precision Livestock farming

Principle : to monitor performances
and the environment to adjust management



information

management decision

CowView

Under development: Agroecology

Use of naturel processes to design sustainable systems

5 principes

- Integrated management of animal health
- Reduction of the use of resources
- Reduction of pollutions
- Uncrease of the resilience of farming systems
- Prreservation of biodiversity within farming systems

(Dumont et al 2012)

Main partners

Science

INRA - Gabi
INRA - ISP
INRA Metafort
Teagasc (IRL)
Univ. Turin (ITA)
Univ. Saragosse (ESP)
Univ. Ghent (BEL)
INRA -MIC
INRA PRC
Univ. Vet. Norway
Univ. Reading (UK)
INRA UREP
INRA Mosar
INRA Pegase

Policy makers

INSTITUT CARNOT ICSA
ANR
AUVERGNE la région juste et grande
FAO
Union Eur.
EFSA
Feder
MESR (DGAL)
MEDDE (Citepa & Ademe)
MAAF (Casdar)

Technology

INRA UERT / UEMA
Arvalis
Limagrain
Alltech
UMT Productions allaitantes et systèmes fourragers
IDELE
Pôles de Compétitivité (Valorial, Vitagora)
Effidence
e-Cow (UK)
Danone
Valorex
Phytosynthèse
In Vivo NSA - Inzo

End-users

Pôle fromages AOP Massif Central
ApisGene
Pôle Agriculture Biologique du Massif Central
SICA Rouge-des-prés
Cantal Conseil Elevage
Museum d'histoire naturelle
Interprofession Saint-Nectaire
GIS Elev. Demain, VPC

> 200 partners

The way forward

- Focus our research to design **sustainable farming systems for herbivores**
  - efficiency/productivity/economy
  - environment: CH4, biodiversity
  - societal expectations: farmers work, animal welfare
- Increase **dialog** with stakeholders and society
- Strengthen international **collaborations**

Thanks for your attention

Future research of ACS

General concept :

to integrate animal behaviour and animal welfare in the design of farming systems / practices

- Relational practices
- Welfare and health
- Welfare and production

for the benefits of farmers, animals, society