A major challenge : translating the professionals knowledge into resources available for and used by the scientific community

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The French Livestock Institute – my functions

- French Livestock Institute:
  - Official professional Institute for applied research on all the topics dealing with ruminants
    - At farm, but also at slaughter
    - For dairy production, and meat production
    - Researches on production factors, economy, genetics, engineering, management …
- JC: project manager
  - Housing design
    - Comfort of animals, ventilation technical references
  - Animal welfare assessment, and practical appliance

Studies on animal welfare conducted by the French Livestock Institute

- From 1998 to 2000: welfare of young cattle exposed to long duration transports
  - About 30 journeys: more than 500 hundred animals (beef cattle and young bulls) were transported
    - Two seasons: winter … East of France
      summer: from centre of France to North of Italy
      - Main goal: explore the widest range of climatic conditions
  - For this experiment: design of an improved lorry fitting all the new E.U. requirements (regl. 1-2005)
    - Check if cattle felt a sufficient welfare in such a lorry

Studies on animal welfare conducted by the French Livestock Institute - 2

- I was in charge with the ventilation system design
  - 5 fans controlled by a software program on an in-board PC laptop
  - In order to improve climatic welfare, I defined a new diagram with different “climatic welfare states”
- *Other studies on welfare*
  - *Deeply involved in Welfare Quality E.U. project*
    - *A new method to assess welfare at farm and at slaughter for cattle, pigs and poultry*

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Innovative works on welfare during transport

- A few similar research programs were conducted
  - In Ireland (Bernadette EARLEY - Teagasc)
    - transport of beef cattle from Ireland to Spain
  - In France : Patrick CHEVILLON – IFIP)
    - Long duration transport of pigs
- A large professional diffusion of the results
  - But no true scientific papers produced

A first acknowledgment :

- A poor transmission of knowledge from professionals to the scientific community
  - A relative “ostracism” of the scientific community towards applied research?
    - Conditions in which applied research is conducted differs from lab. experiments
      - It is very difficult to control all parameters in practical
  - An important part of professionals knowledge is not written
- Difficulty to find revues accepting papers on applied research
  - “applied research” itself is not refused, but the frequent lack of measures on physiological parameters is a major difficulty

The first difficulty for research about transport: the nature of the context

- In applied research during transport, conditions of the experiment interfere with controlled factors
  - It is almost impossible to isolate a single factor
    - We are always in a multifactorial context
    - Difficulties to conclude about the effect of a define factor
      - The result is depending of the combination of all the uncontrolled (but measured) other factors.

Results are depending on conditions of transport

- The inside conditions are highly influenced by the outside climatic conditions
  - The range of conditions is not so wide as what could be obtainted in laboratory context
- An intense link between results an practice
  - A gentle driver does not stress the bull
  - An appropriate design of all the equipments better fits the animals requirements
- How to explore poor and good welfare conditions for transported animals?
  - Was it a mistake to use an improved lorry?
    - Mixture between experiment and practical trial

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On the other hand: lab. experiments are sometimes far from reality

- How to create “transport conditions” when conducting an experiment inside an immobile laboratory?
  - Is it worth to try to reproduce vibrations, accelerations, noises …?
    - Difficulties with modelising a complex environment
    - Cost of such experimental installations
    - Size of the required climatic chamber (many animals together) to reflect actual transport conditions…
- Generally: lab. experiments are conducted on a reduced and simplified model of the reality
  - They do not reflect all the complexity of practice

Do we assess either reality or the incidence of the experiment on reality?

- PB: measurement of animal stress at farm or during transport
  - Blood sampling for instance (even with automatical samplers) is potentially a source of stress
  - Hearth rhythm measurement devices modify behavioural patterns of animals
    - Not only the equipped one but also congeners
      - Interest for a novel object >> play patterns, induced aggressiveness …
- By experimenting, we create artefacts
  - Risk is the same for lab. experiments and for applied researches

Consequences of these difficulties

- Classical rules to design experimental protocols are difficult to follow for applied research
  - The “control” treatment is not always present
    - Example: our experimental lorry for cattle transport was not observed in parallel with an ordinary one
      - Main reason: the cost of a doubled experiment
        - » It needs two staffs: drivers engineers, technicians …
  - Linked to this major lack of information: it is very difficult to give a **scientific evidence**
- E.U. Commission should take into account results of applied research
  - Is the truth only inside the scientific papers?

What could be more easy to do in a "commercial" context *(at farm or during transport)*?

- We could observe a large number of situations
  - Advantages:
    - the variety of encountered situations
      - Reflects the complexity in practical context
  - Drawbacks:
    - Only the description of the results is allowed in such an "uncontrolled" situation
    - Only a few simple measurements are practicable
      - Cost, technical difficulties

What should be done for a more efficient transmission of professional knowledge?

- Combine classical laboratory research and applied research
  - Organise joint experiments between ‘pure science’ and ‘applied science’
    - For instance common projects between INRA and Institut de l’Elevage
      - Partially the case for transport study (1999-2000)
  - Prepare scientific data before organising applied research programs
    - In order to qualify climatic welfare during transport, we need a scientific model of “climatic welfare”
      - Such a model is not available >> difficulties to give a scientific basis to practical experiments

The clue of success: anticipate

- Starting research programs after a question is addressed by professionals: **it is far too late**
  - Very long duration of these programs
    - i.e two years from the first question to the first results for our experiment on an improved lorry (1999-2000)
- Anticipation is needed from the professionals
  - We must encourage earlier debates between professionals organisations and applied research institutes