phytosynthese

the animal titrated phytodietetic

François RECOQUILLAY- R&D Manager

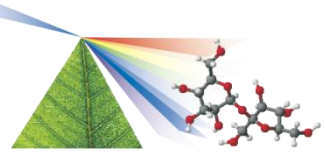
The Company

Created in 1997 by the actual manager and main share holder : Thierry Picaud

The company is developping since this time in all animal productions:
-Poultry
-Ruminant
-Pig
-Aquaculture
-Others (game birds, rabbit)
-Petfood

Two main ranges:
-Feed additives
-Dietetic feed

Our objectives



Phytotherapy research

Research into the best active plant extracts to develop titrated additives which fulfill the zootechnical and sanitary expectations of the animal husbandry sector.

Expertise in animal nutrition

Application programs designed in line with species, development stage, type of production and sanitary context.

Location

Based in France in Clermont-Ferrand
Center of France

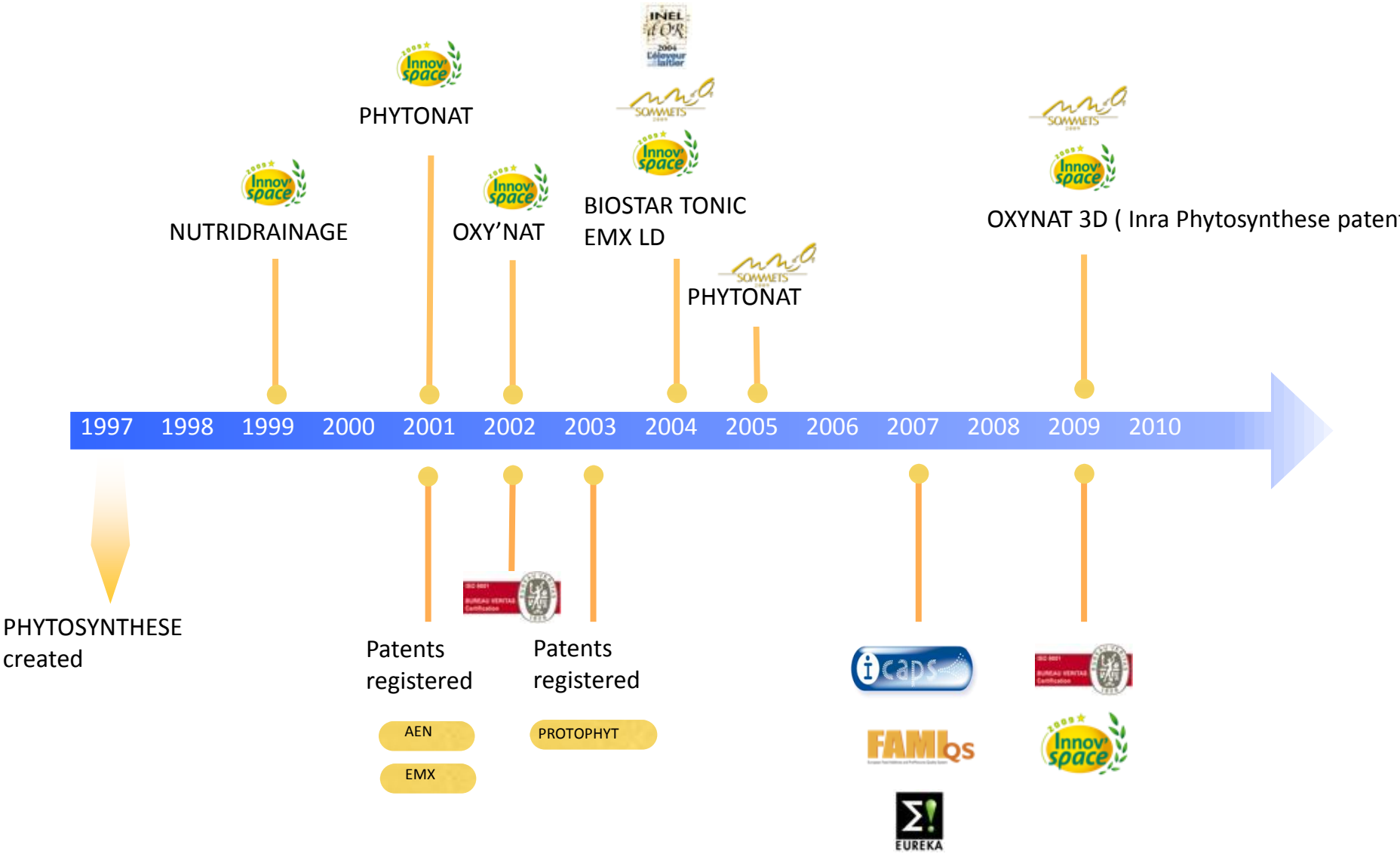
The heart of rearing

Exceptional pool of ressources

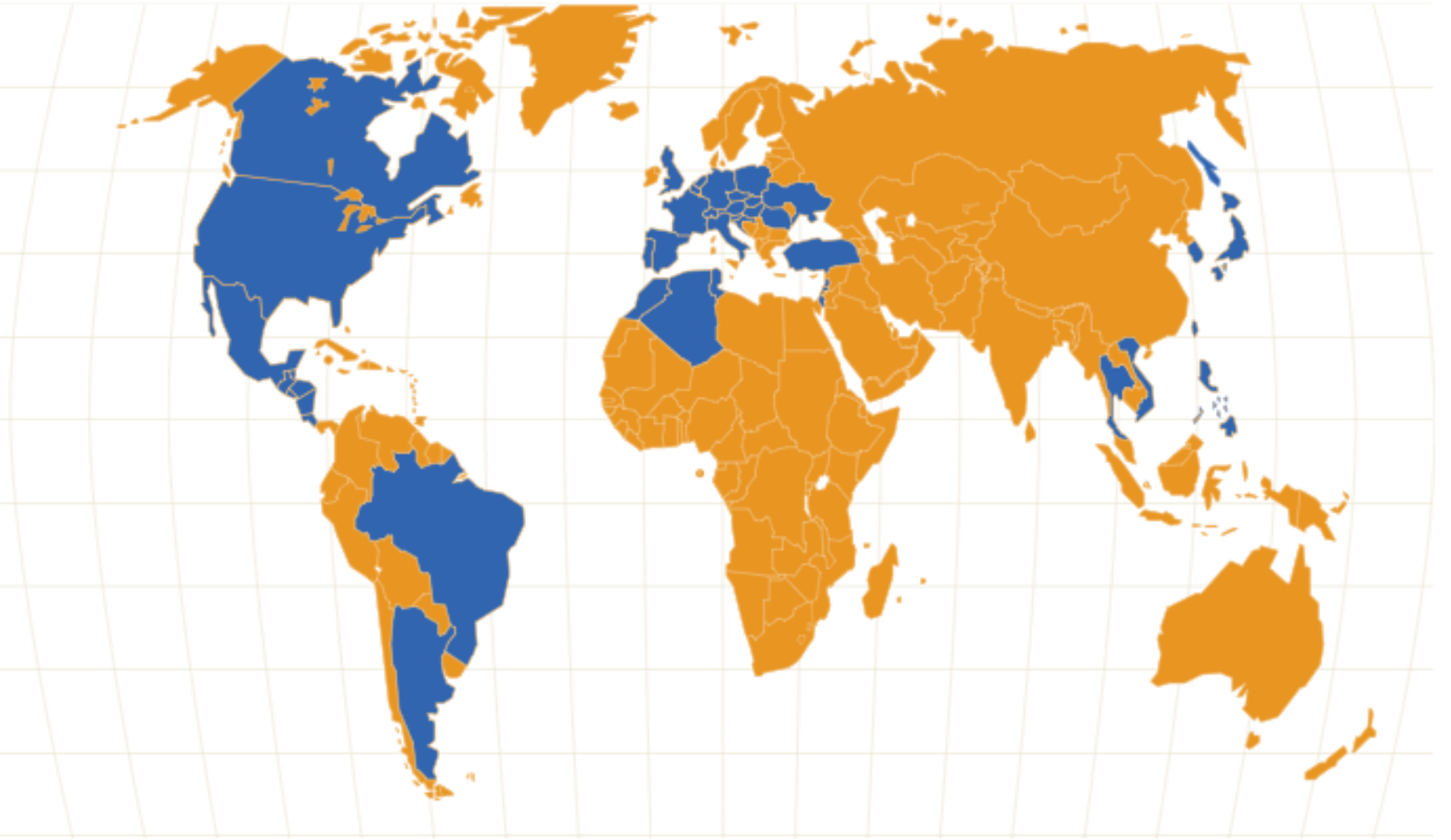
35 000 students, 6000 researchers

Top of the list for dynamic cities in France (2010)

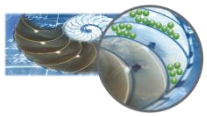
Constant innovation



International distribution network



I-C@P'S Technology



Principle

Our microcapsules allow volatile and hydrophobic substances to be protected, like essential oils and all other sensitive plant extracts through microscopic protective network combing thermal resistance and total release

Technique

Dynamic fluidized bed

Avantages

- **Fixation** of active principles
- Better **fluidity**
- Greater **stability**
- Increased **resistance** (t°, lux,H_20)
- Greater **concentration limits**

Production

A factory which meets the most demanding norms

- **Powder form** packaged in foil lined bags for guaranteed preservation of volatile substances, designed for industrial clients.

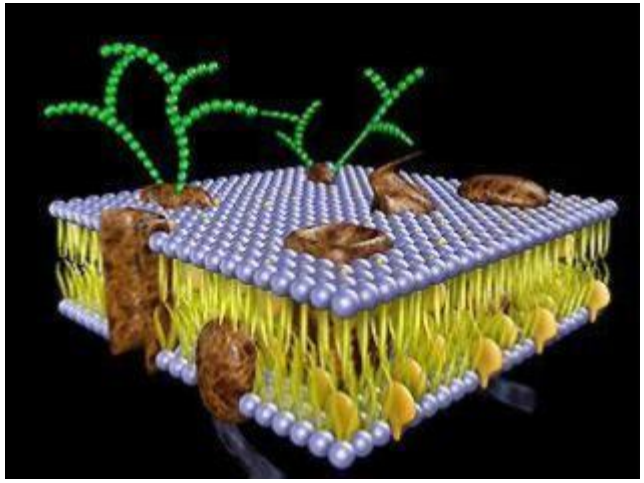
- **Liquid form** designed for veterinarians.

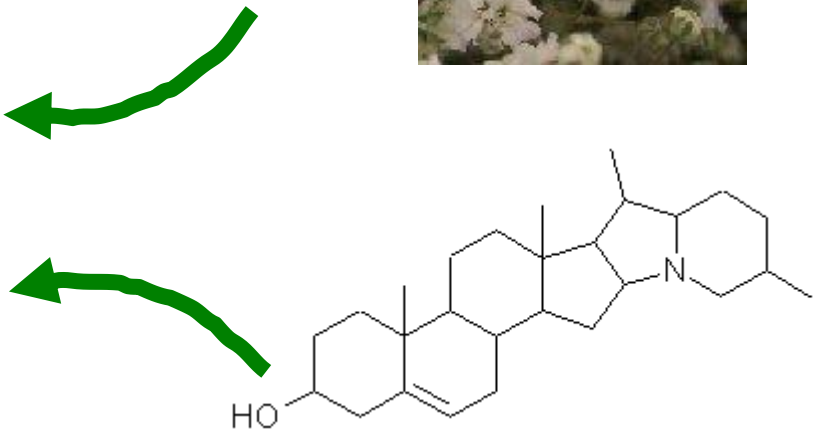
Examples of topics

Management of Protozoa

❑ Identified Plant extract: Saponin sources

Mode of action : Interactions with cell membranes *(transitional integration of the saponins in the membrane structure, membrane sterols)*

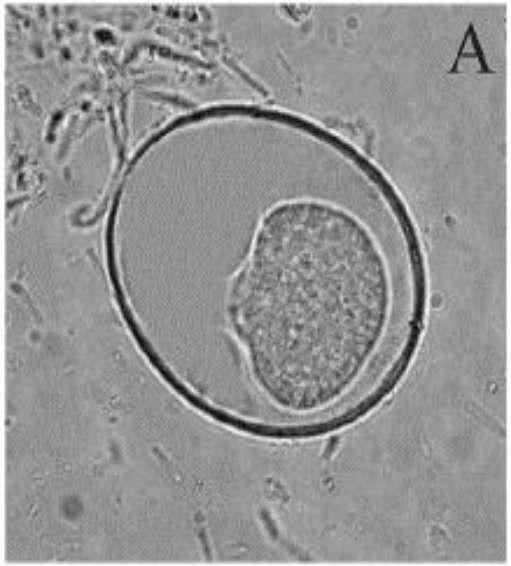


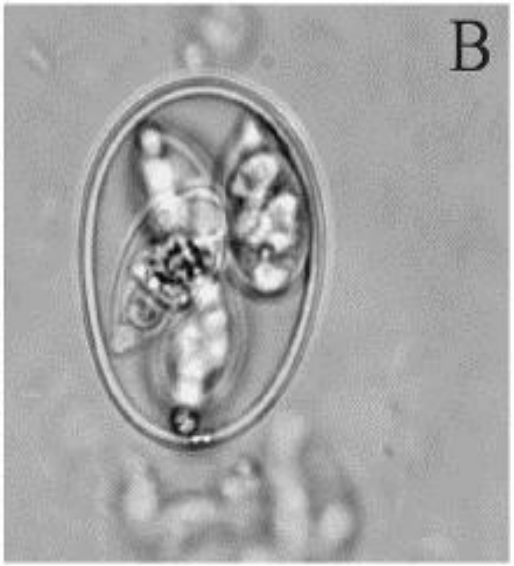


Management of Protozoa

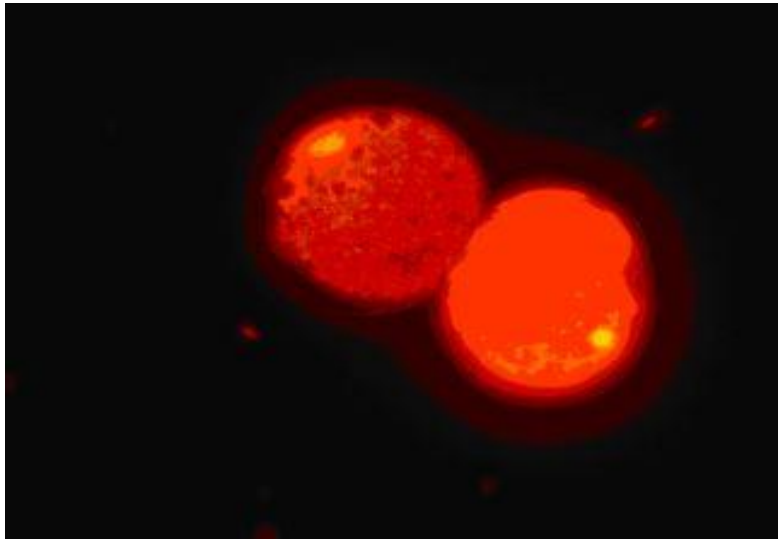
Eimeria sp.:

Visualization of sporulation





A ➨ Oocyst non sporulated after plant extract component activity.
B ➨ Sporulated oocyst.



Non viable Oocysts. Highlighted by fluorescence.

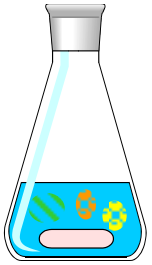
These observations allow the efficiency of plant extract components to be determined by counting after activity .

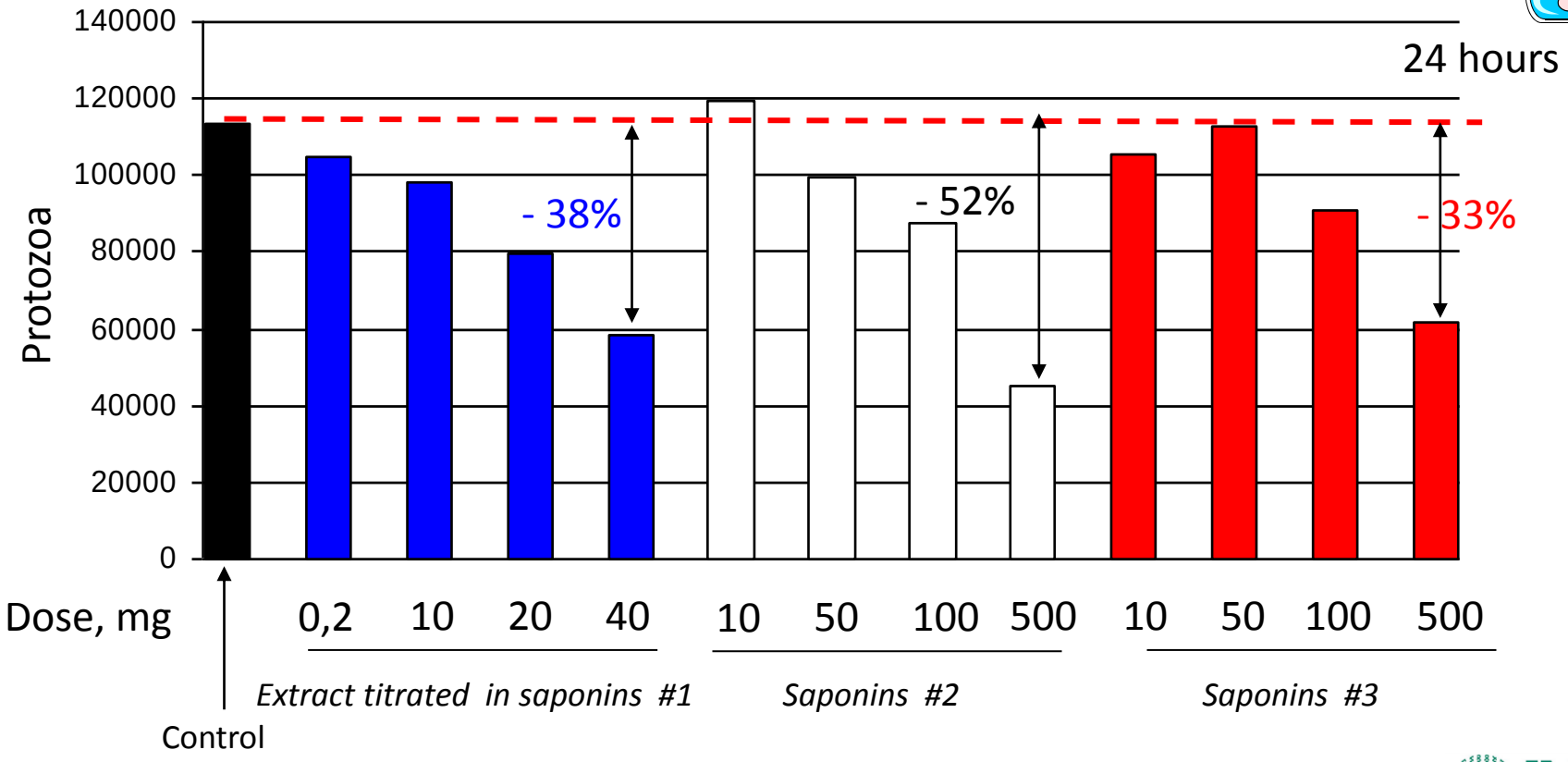
(PHYTOSYNTHESE trial – IRTA Institute (SP) - 2008)

Management of Protozoa

Rumen protozoa:

24 h *in-vitro* batch method



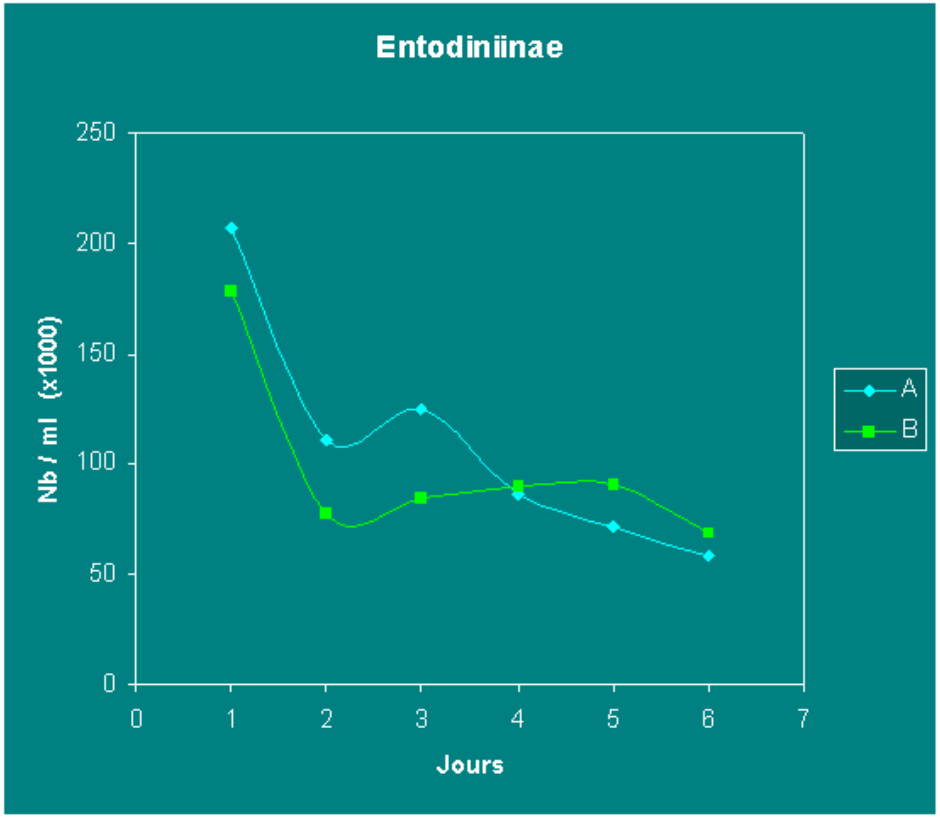


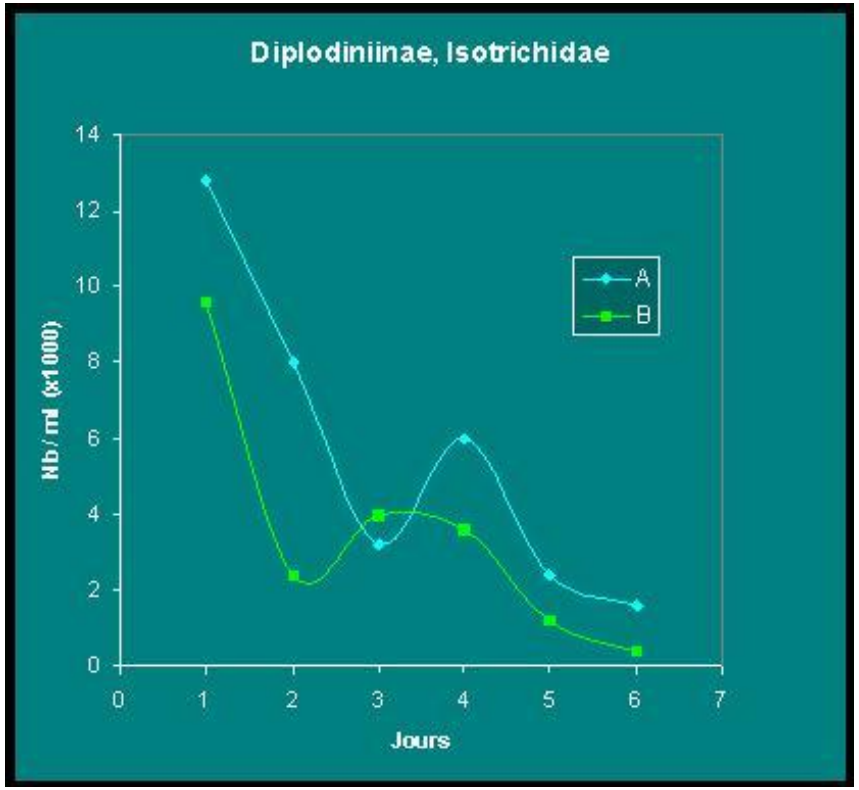
INRA / Theix (Jouany for PHYTOSYNTHESE, 1999)

Management of Protozoa

Rumen protozoa:

Dual-flow fermentors kinetics





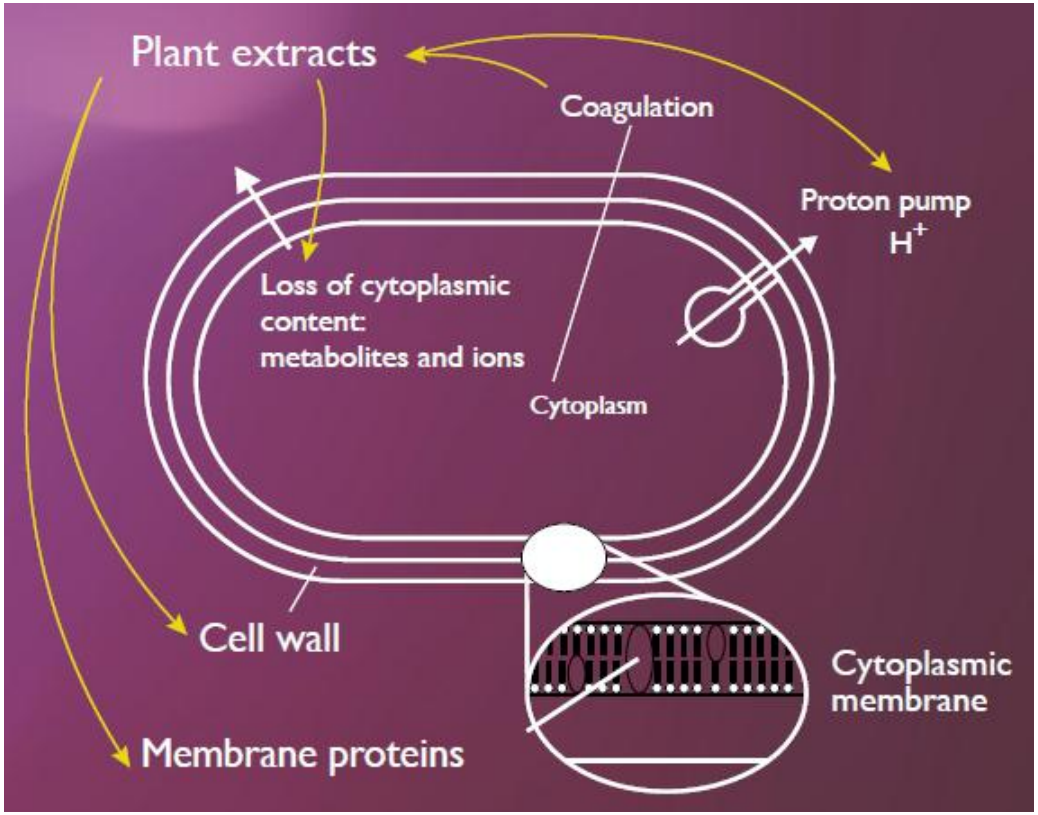
(INRA executive trial to PHYTOSYNTHESE- 2004)

Microflora Management

- Identified Plant extract: Essential oils

Mode of action for active plant extracts: (and in particular for essential oils)

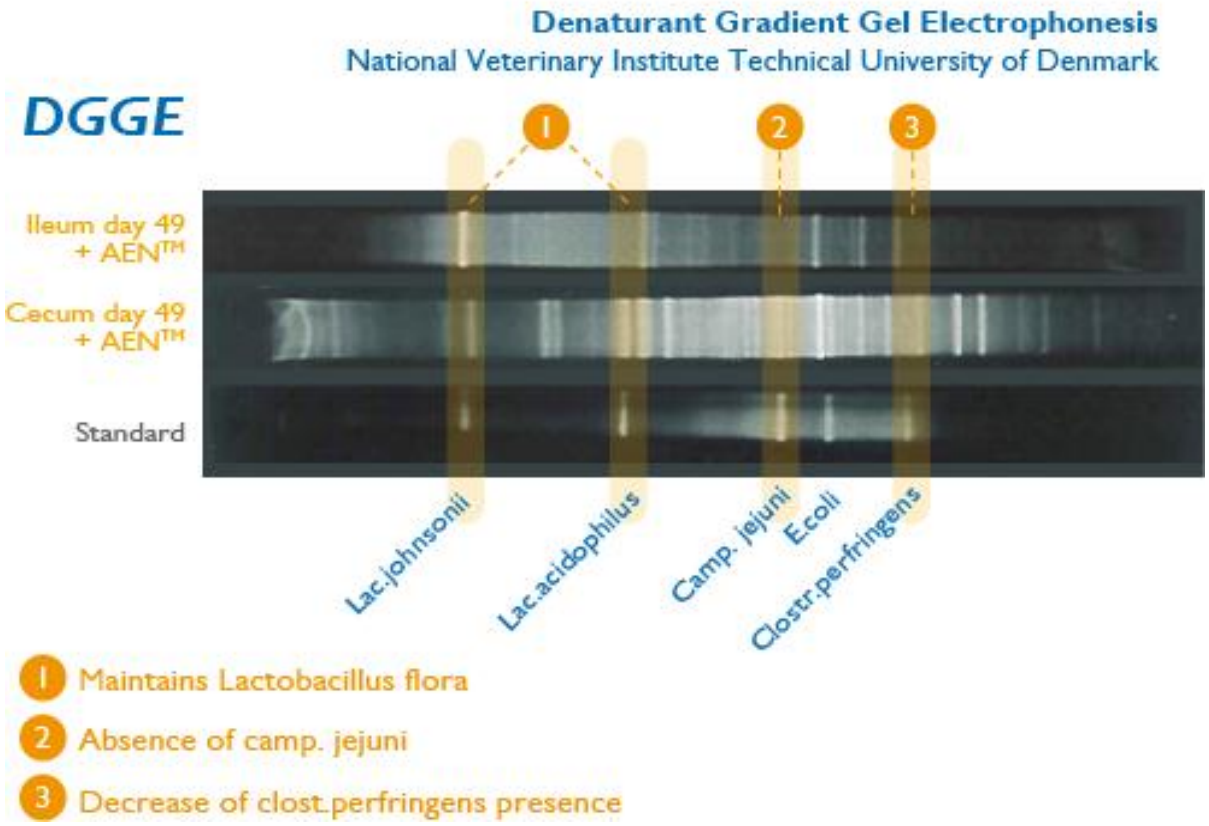
Diagram according to BURT (2004)



Microflora Management

Poultry lower gut:

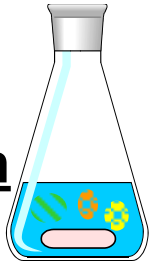
Caecum and Ileum flora profiles

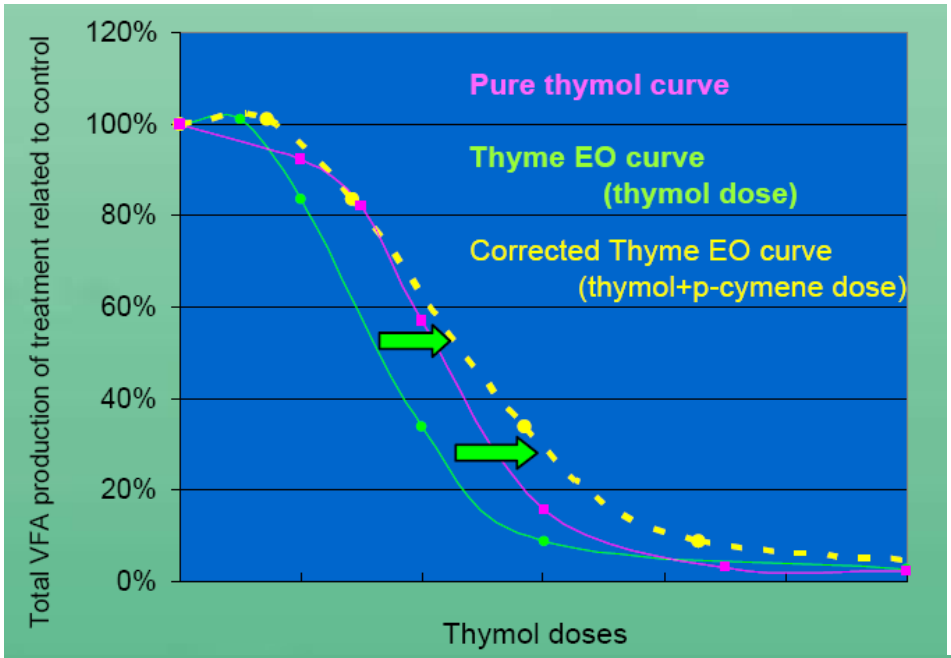


Microflora Management

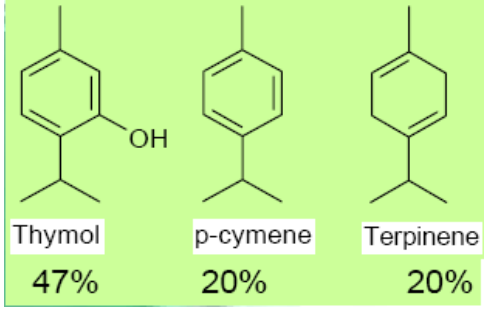
Rumen:

Dose-response effects on *in-vitro* total VFA production





Main constituents of thyme EO



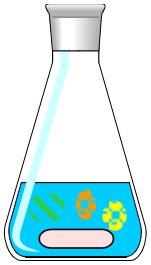
- For all end-products, the sigmoid curves obtained from pure thymol or thyme EO had the same profile.
- However, the necessary dose to obtain the same inhibitory effect was lower for thyme EO than for pure thymol indicating that the natural EO had a stronger effect.

(Macheboeuf et al., 2004)

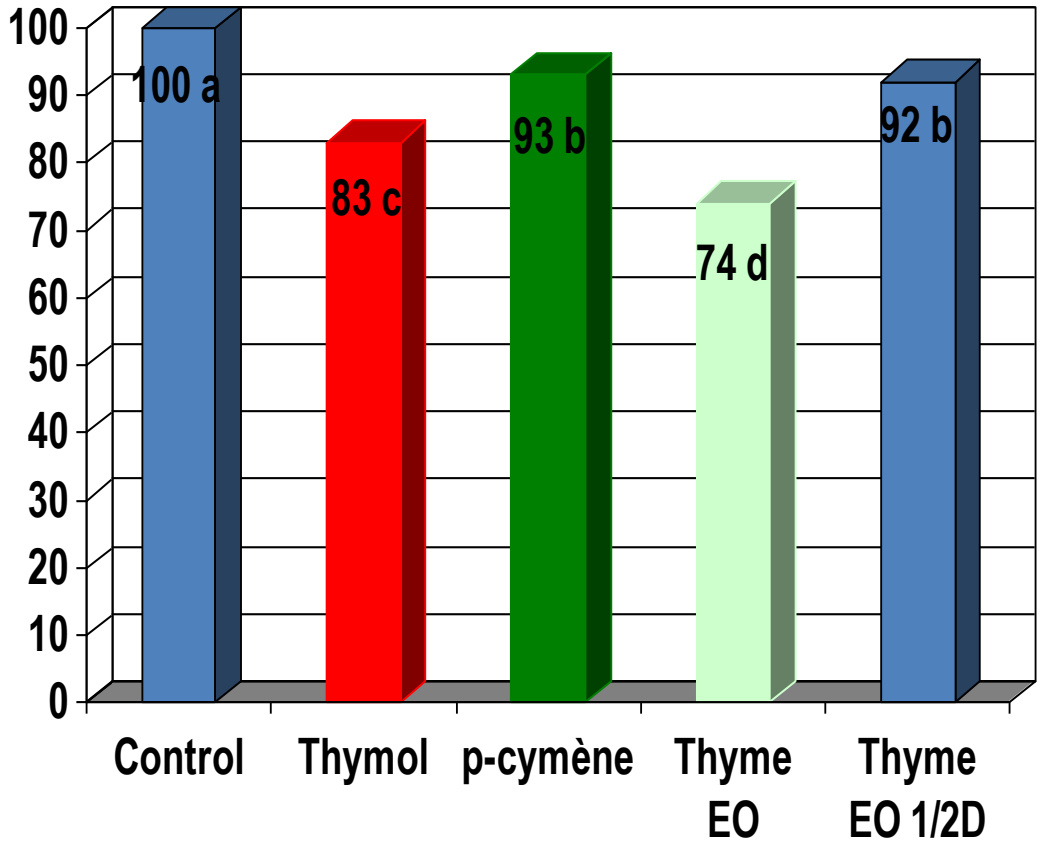
INRA

Microflora Management

Rumen:



Quality effects on *in-vitro* total gaz production (5 hrs)

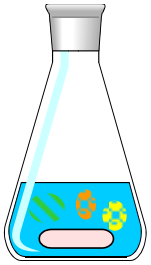


a,b, c, d P<0,05

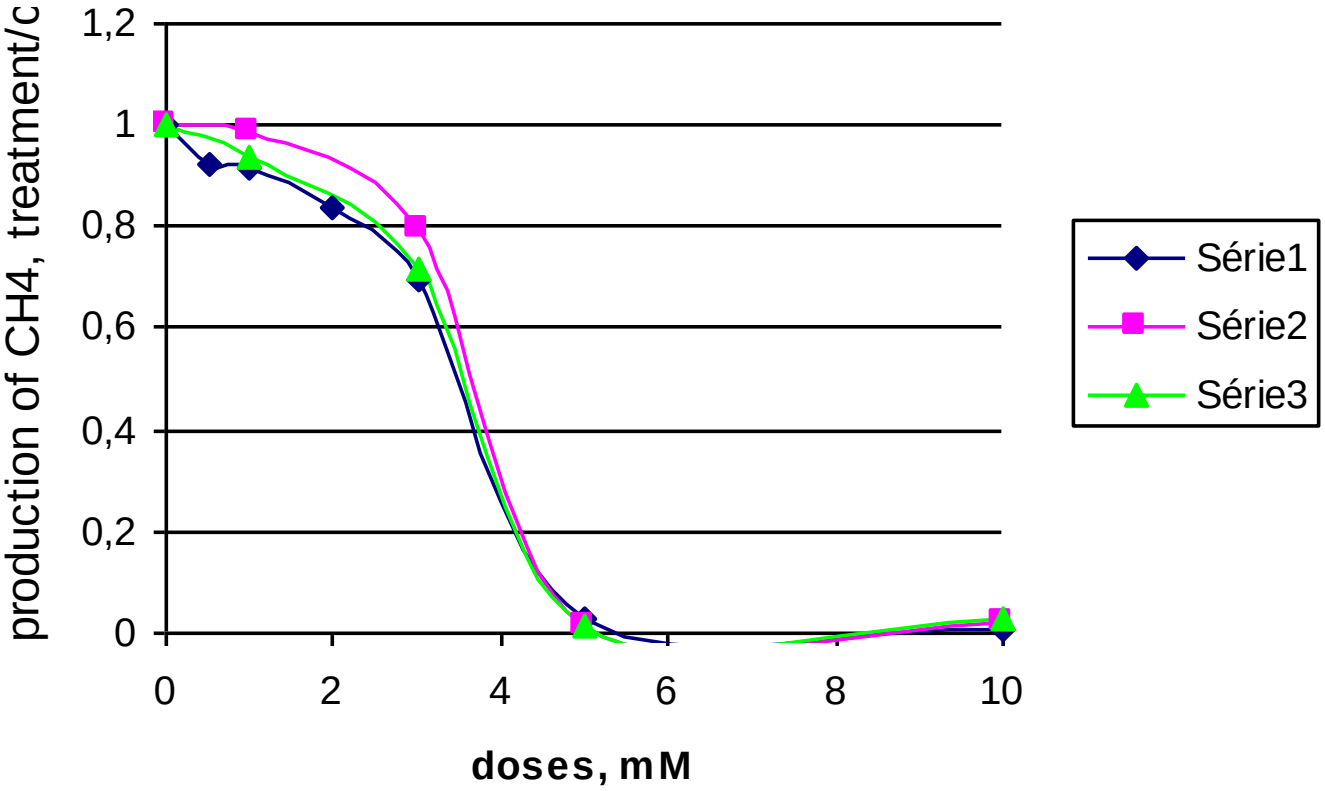
INRA / Theix (Macheboeuf for PHYTOSYNTHESE, 2004)

CH_4 production, first steps…

In-vitro incubation:



EO dose-response effects on CH_4 production

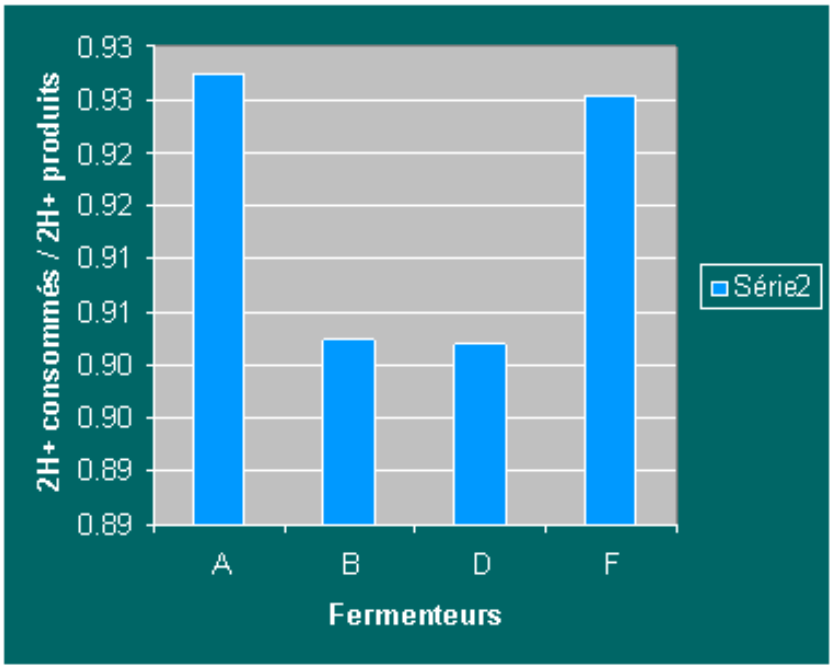


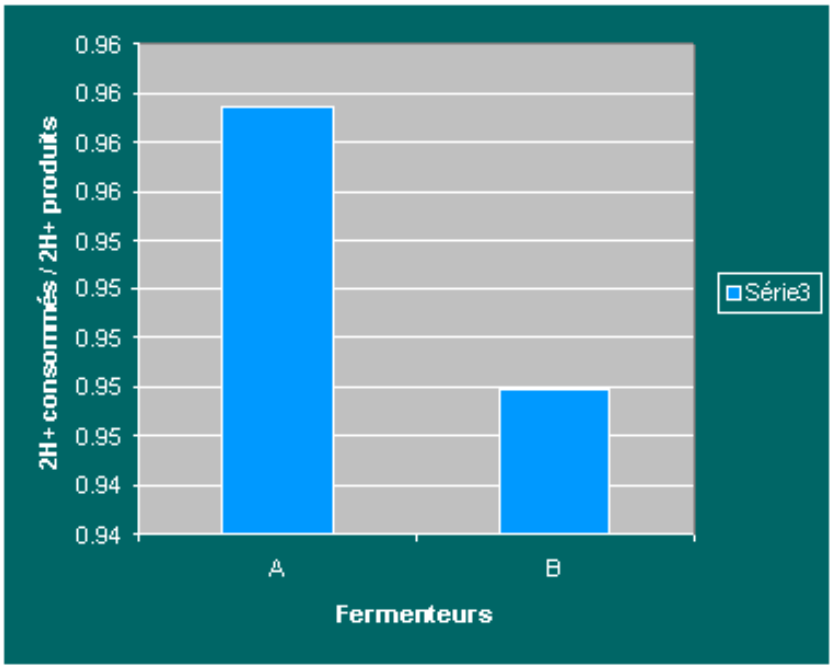
INRA / Theix (Macheboeuf for PHYTOSYNTHESE, 2003)

CH_4 production, first steps…

Hydrogen metabolism:

Dual-flow fermentors kinetics





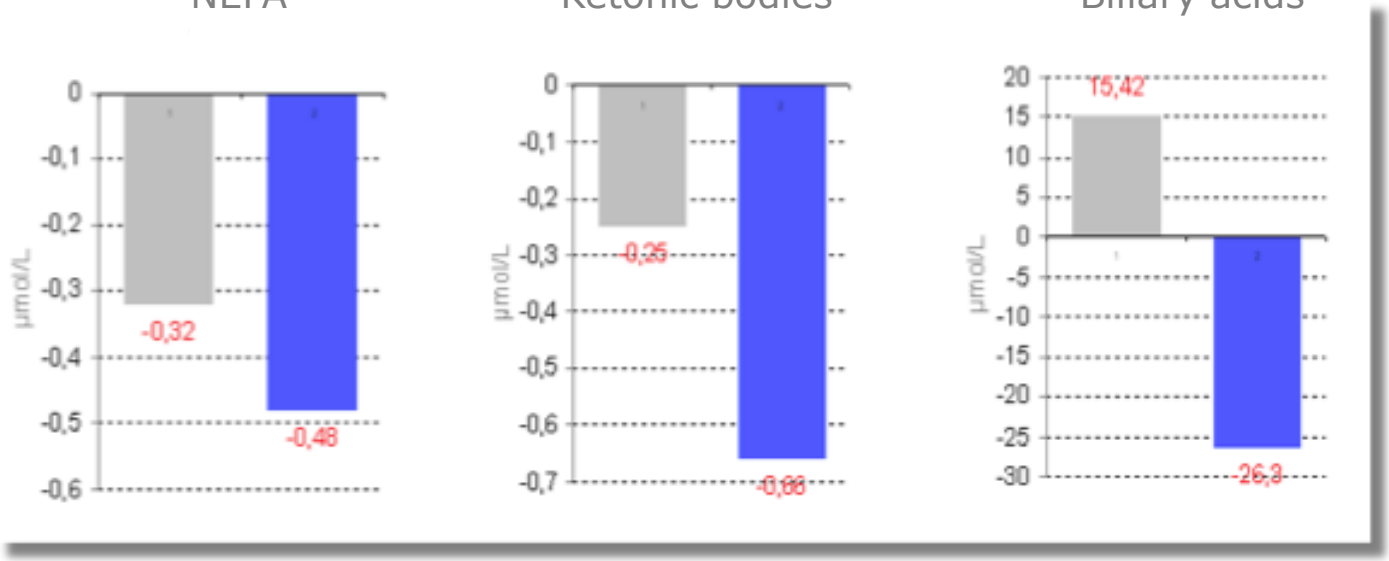
Effects due to EO and saponins on Hydrogen use and release

(INRA executive trial to PHYTOSYNTHESE- 2004)

Other TOPICS…

Metabolism of the liver

HEPATOPROTECTIVE ACTION



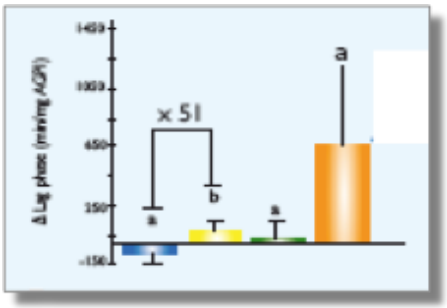
Renc. Rech. Ruminants, 2002, **9** (Durand et al; 2002)

Other TOPICS…

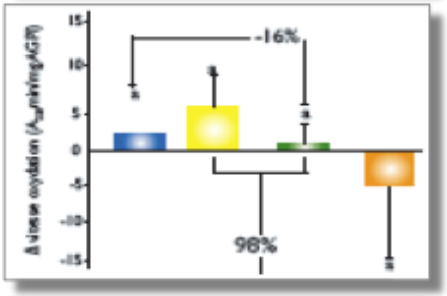
Anti-oxydant activity:

PROPAGATION OF CONTROLLED OXIDATION

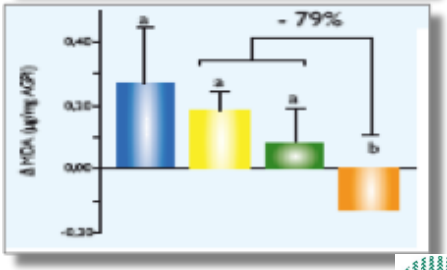
— Effect on the initiation of oxidation



— Effect on the speed of oxidation



— Elimination of toxic metabolites



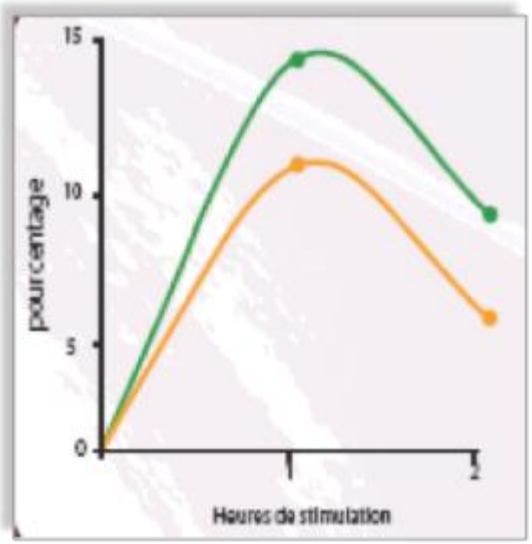
(Eureka 2035Inra PhD Thesis C Gladine, 2007)

Other TOPICS…

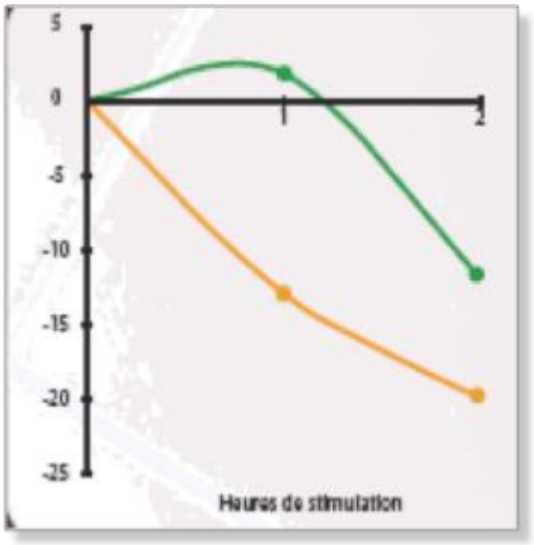
Neuro vegetative Action:

Effect of plant extracts on piglets subjected to stress of transport

Cardiac frequency difference



Cortisol difference



Control
SEDAFIT : additive titrated in Isovitexine

(PhD E.Peeters et al., 2004)

Thank you for your attention