



Ralph NEHME



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UMR INRAE - L'Institut Agro  
Rennes-Angers

Science et technologie  
du lait et de l'œuf

PSF team

Process - Structure - Functionality

Keywords

*Thymus capitatus* essential oils

Subclinical mastitis

Milk quality

Encapsulation

Complex coacervation

Antibacterial

Anti-inflammatory

Funding



Collaborators



# Evaluation of antibacterial and anti-inflammatory effects of *Thymus capitatus* essential oil against mastitis in dairy cows

## Socio-economic context

- Subclinical mastitis (SM) is a major economic problem for dairy producers because it:
  - decreases the milk production
  - impacts the cow's fertility
- Bovine mastitis is usually treated with antibiotics that represent a major environmental problem as they increase the antibiotic resistance.

## Scientific context

- Studies show that *Thymus capitatus* essential oil presents antibacterial and anti-inflammatory properties against pathogens responsible for SM in *in vitro* tests
- No studies about its effects on milk quality and microbial composition when applied directly over the udder surface

## Research question

What are the effects of topical application of *Thymus capitatus* essential oil on the cow's health and milk quality? Does its encapsulation enhance its antibacterial and anti-inflammatory effects?

## Expected Results

The following strategy is used:

### *In vivo*

Application of *Thymus capitatus* essential oil on 12 cows with subclinical mastitis:

- Inflammatory parameters
- Milk quality

### *Ex vivo*

Inflammatory effects of *Thymus capitatus* essential oil:

- Cow's PBMC\* stimulation with toxins and essential oils

### *In vitro*

*Thymus capitatus* encapsulation by complex coacervation and nanoemulsion

- Evaluation of its antibacterial properties

\*PBMC: peripheral blood mononuclear cell

## Perspectives

- Understand the mechanism of action of *Thymus capitatus* essential oils and its major components
- Optimization of *Thymus capitatus* essential oil encapsulation by complex coacervation and nanoemulsion
- Following the project results, support the dairy producers with recommendations to optimize the use of essential oils in cattle farming