

Vaccine against Bovine Mastitis

University of Chile has generated a formulation of a highly immunogenic, multivalent subunit vaccine that immunizes cattle against 3 strain of pathogens that cause bovine mastitis

THE CHALLENGE

Bovine Mastitis is prevalent worldwide in cow populations and most of vaccine only reduce antibiotic use. This disease affect all cow herds regardless of sanitation. On average there are between 20-25 cases of Bovine Mastitis for every 100 cows per year. The disease induce a reduction in milk production and quality up to 30%. The antibiotic treatment is still needed, even with the use of currents vaccines. Furthermore, when cows are receiving antibiotics against Bovine Mastitis, their milk production is usually unsuitable for human use when the cows are receiving antibiotics. Thus, the development of vaccines with strong immune response in order to reduce or even suppress the amount of antibiotics are necessary to fight the disease without affecting the milk production.

THE TECHNOLOGY

A vaccine formulation that combines antigenic fragments from three pathogenic microorganisms (*E.coli*, *Staphylococcus uberis* and *Streptococcus aureus*) with liposomes, which improves the effectiveness and the duration of the cow's immune response against bovine mastitis. The technology also address a new formulation process that generate nanovesicles and liposomes highly antigenic with a size under 1µm.

STAGE OF DEVELOPMENT

- Lab trials validation (ELISA, *in vitro* SEM, SDS-PAGE)
- Mice trials security and efficacy (injection; 4 groups).
- Heifer trials (n=60, 4 groups, 30 vaccines).
- Control trials (n=150, 3 groups, 100 vaccines).
- PABCO official certification programme for livestock establishments trials (n > 450, 3 groups, > 150 vaccines).
- Chilean Government Livestock and Agricultural Services (SAG) regulatory register in process.

COMPETITIVE ADVANTAGES

- Uses liposomes of 3 major pathogens and induces strong humoral immune responses.
- Results in combating *E. coli* similar to Pfizer's one-component vaccine (Envirocor J-51). Vaccinated cows showed significantly higher milk antibody titers.
- Dosing and administration identical to current vaccines, but more efficient (48.5% reduction in Colony Forming Units (CFU) in all pathogens) and affordable (\$14.4 for 3 doses).

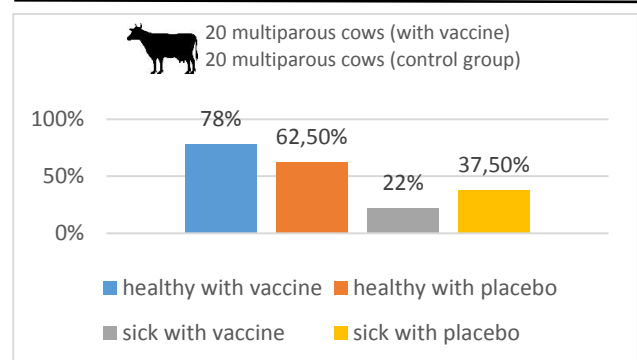


Figure 1. Percentage of multiparous cows (healthy and sick), 30 days after the second vaccine, according to sanitary status and treatment.

OPPORTUNITY

University of Chile is searching for industry partners for out-licensing.

INTELLECTUAL PROPERTY/REFERENCES

- Chilean patent application 201403247, Colombian patent application NC2017/0005389, Brazilian patent application BR1120170112922 and Mexican patent application MX/a/2017/006892.