

**Gisela Ferro Falgueras**  
Final degree project. June 21<sup>st</sup>, 2019

## Introduction

- Tuberculosis (Tb) is a zoonotic disease with implications for public health and causes huge economic losses worldwide.
- In Europe there are eradication programs for the control of Tb in cattle but not in goats.
- In Catalonia there is only a strategy for milk farms under 12% positive of Tb that wants to be certified as Tb free (T3).
- Bacillus Calmette-Guérin vaccine (BCG) is an attenuated strain of *Mycobacterium bovis* that would be effective to reduce Tb in goats.

## Objectives

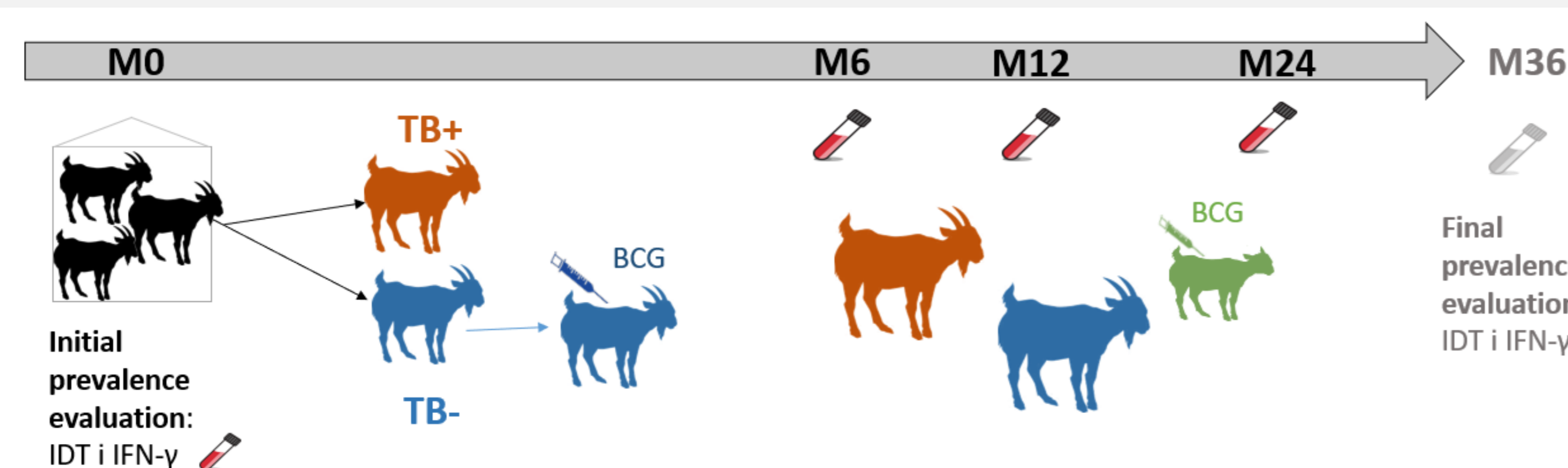
- Evaluate the effect of BCG in a field study.
- Analyze the data and relating it among the different factors.
- Provide a solution and support for Catalan farmers that cannot be included to the current strategy.
- Reduce the Tb prevalence from herds and eradicate the disease in goats.

## Material and methods

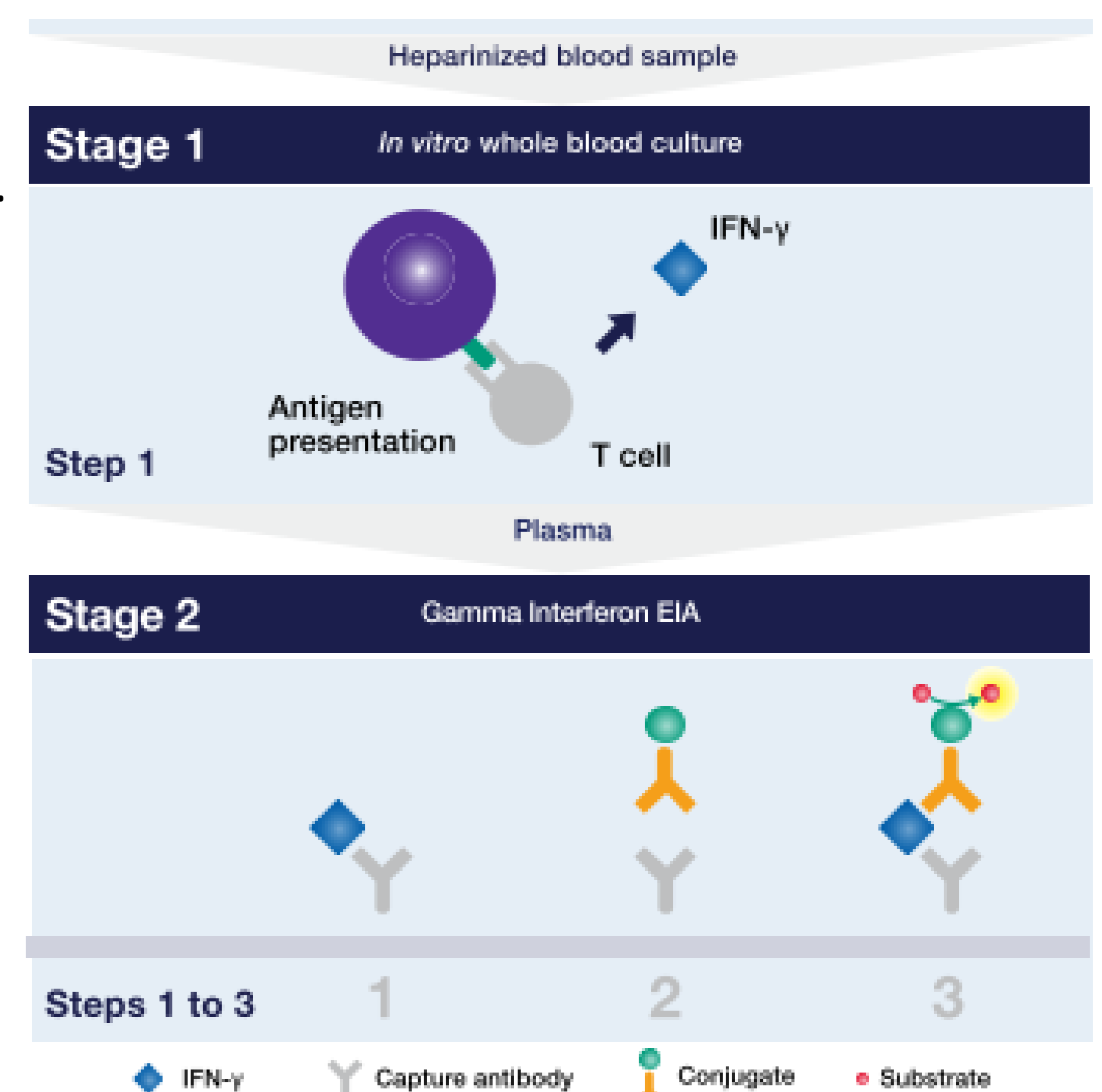
- 5 Farms: 3 milk, 1 meat, 1 mix. All have different facilities and handling routines.
- Intradermal tuberculin test (IDT).
- Gamma Interferon test (IFN- $\gamma$ ). Blood stimulation with PPD bovine and avian antigens.

### Facilities and Handling routine

- Farm 1: meat, extensive herd. Sacrifice all positive animals.
- Farm 2: milk, intensive, goat kids are feed by their mothers.
- Farm 3: milk, intensive, from 2018 on goat kids are feed with pasteurized colostrum and milk replacer.
- Farm 4: milk, intensive-pasture and ecologic, goat kids in contact with mothers.
- Farm 5: mix, intensive, all animals are at the same barn.



**Systematic vaccination of the reposition:**  
Prevalence evaluation with IFN- $\gamma$  at month 6, 12 and 24 post vaccination. (Modified from Arrieta-Villegas, Claudia)



(Modified from Bovigam® TB Kit)

## DIVA test

- Resolves the diagnostic interference of vaccine with IDT.
- ESAT-6 and CFP-10 (EC) are specific antigen of *Mycobacterium tuberculosis* complex that are not present in BCG vaccine.
- Blood stimulation with EC is needed to determine if the animal is infected or vaccinated.

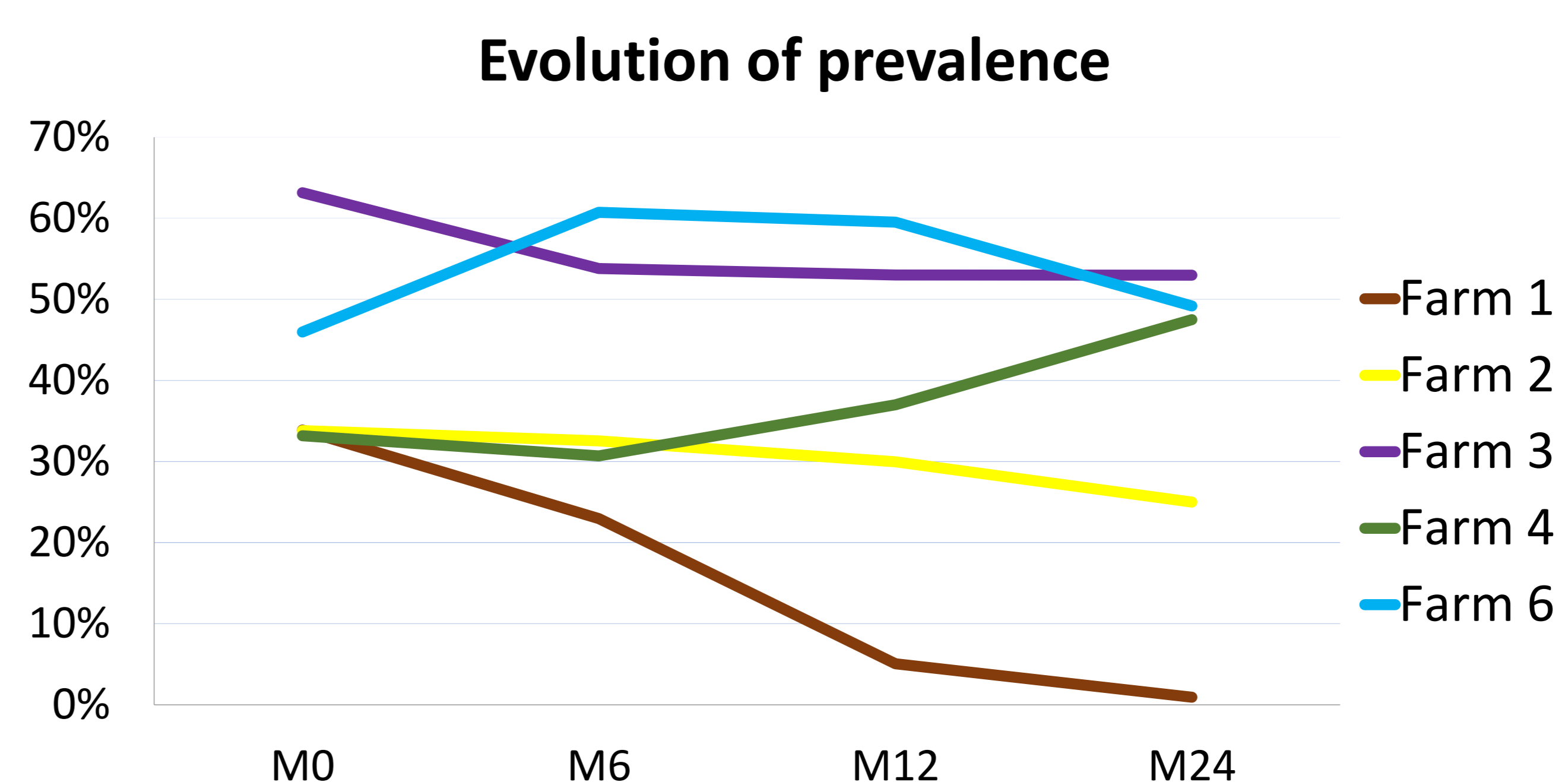
## Results

Table 1. Tb prevalence in all farms

	M0	M6	M12	M24
<b>N</b>	1659	1766	1662	1726
<b>TB+</b>	41%	38%	37%	32%
<b>TB-</b>	59%	62%	63%	68%

Table 2. Tb prevalence in negative animals at M0

	M0	M6	M12	M24
<b>N</b>	979	1233	1244	1359
<b>TB+</b>	0%	11%	16%	23%
<b>TB-</b>	100%	89%	84%	77%



Graphic 1. Evolution of prevalence by farms

## Conclusions

- The best method to reduce prevalence from herds is killing all positive animals.
- When farms do not have the economic capability to do it or they have important prevalence, BCG vaccine could help to reduce prevalence at the point that eradication by sacrifice could be done.
- To increase BCG vaccine effect:
  - Goat kids should be separated before they drink mother's infected colostrum, and
  - Infected animals should be physically separated, avoiding direct contact, from the non-infected ones.
- M36 will be done in June 2019