

Preliminary report of potential **biostimulation methods** based on  
**chemical communication** in rabbit doe reproduction

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## BACKGROUND

## BIOSTIMULATION METHODS

Lighting control



Feeding control



Suckling control



## CHEMICAL COMMUNICATION

- *Pheromones (urine, seminal fluid, etc.)*
- *Animal behaviour and reproduction*
- *Likely mediates doe exposure effect (males) and buck effect (females, pimiparous)*
- *Female-female interaction prior to artificial insemination (AI)*



## OBJECTIVES

1. To check whether **female-female interaction prior to AI** has an effect on their reproductive parameters: receptivity (vulvar color), fertility (calving rate), prolificity and number of born alive and dead kits / litter, and therefore can be used as a biostimulation method.
2. To determine whether **exposure of urine / seminal fluid** (as a source of pheromones) **to female does** has an effect on their reproductive parameters: receptivity (vulvar color), fertility (calving rate), and prolificity and number of born alive and dead kits / litter.



## MATERIAL & METHODS

### 1. Urine and seminal fluid (SF) collection and preparation

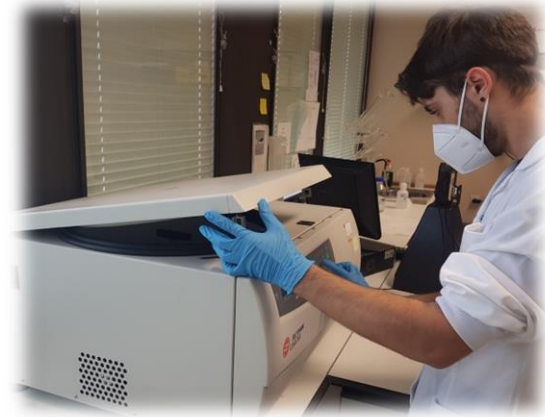
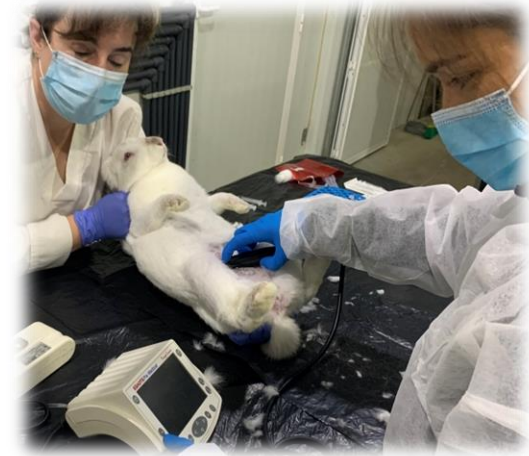


24 h, 4°C

Urine: pure

SF: centrifugation; 1:3 in serum

### 2. Other biostimulation methods



## MATERIAL & METHODS

### 3. Experimental design

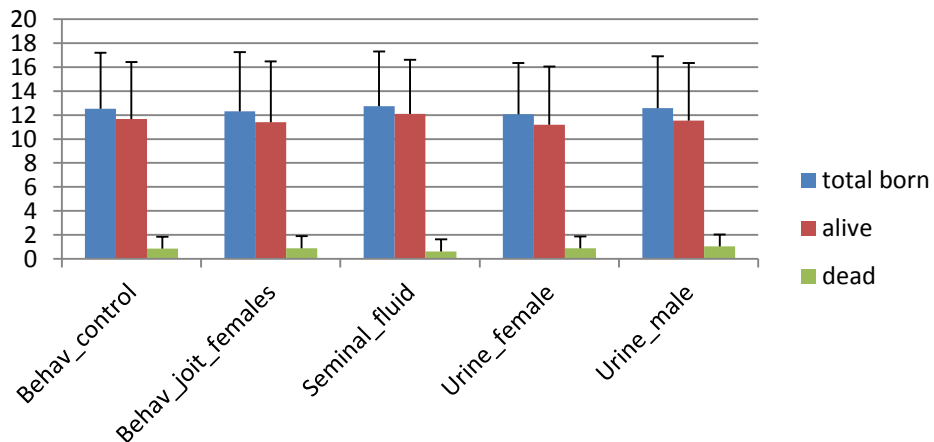
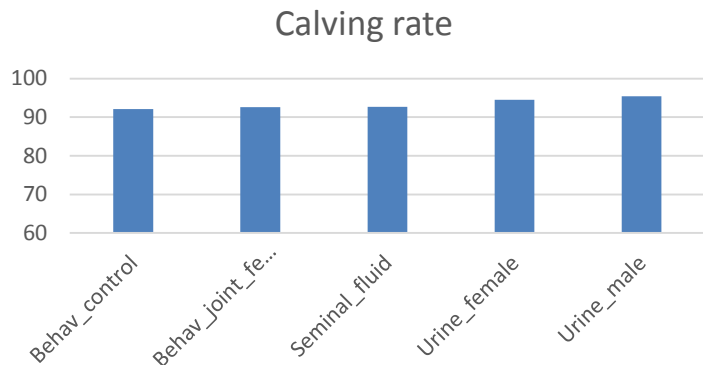
<i>Group / Procedure</i>	<i>Explanation</i>
<b>1. Female-female interaction</b>	Two does were placed in the same cage 15 min before AI
<b>2. Urine female</b>	Urine female exposure
<b>3. Urine male</b>	Urine male exposure
<b>4. Seminal fluid</b>	Seminal fluid exposure
<b>5. Isolated females (control)</b>	Animals kept in their own cages

- 60 lactating does / group (between 3<sup>rd</sup> and 9<sup>th</sup> calves)
- Exposure to fluids (spray) 1h, 10 min and 1 min before AI (1ml/each)
- Repeated 3 consecutive AI cycles
- Measurement of reproductive parameters: **receptivity** (vulvar color), **fertility** (calving rate), **prolificity** and **number of born alive and dead kits / litter** were checked

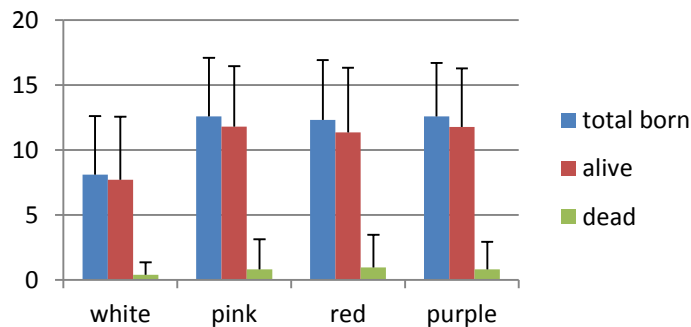


## RESULTS

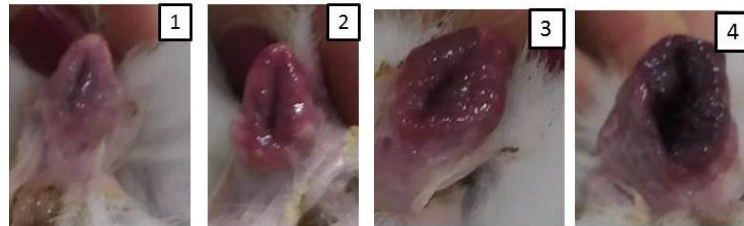
1. No significant differences in any reproductive parameter were found between experimental groups



2. Does presented with white vulvar colour have a reduced number of total born individuals

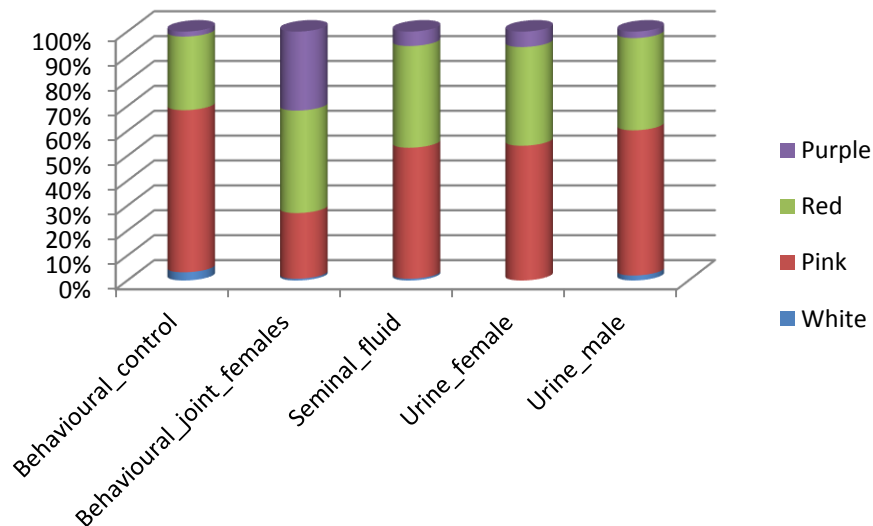


Receptivity was checked by vulvar colour



## RESULTS

3. Behavioural joint group have the highest percentage of purple vulvar colour individuals whereas behavioural control group (BCG) have the highest percentage of white vulvar colour individuals (no significance)



### Of note:

- Vulvar colour does not correlate with fertility and prolificity rates: pink, red and purple could be joint and defined as 'non-white'
- Only 1.3% of all individuals have white vulvar colour (good synchronization rate)
- Despite there is slightly higher percentage of white vulvar colour in the BCG (3.3%), this is still very low, suggesting that **female-female interaction prior to AI is NOT an efficient biostimulation method**

## **CONCLUSIONS**

1. Urine and seminal fluid do not influence any of the analyzed reproductive parameters
2. Female-female interaction prior to AI is not an efficient biostimulation method
3. No differences in any reproductive parameter can be detected between the experimental groups
4. Receptivity assessment should be done by considering 'white' and 'non-white (pink, red, purple)' vulvar colour analysis
5. There is no need of using eCG in female synchronization when other biostimulation methods are used

## **FURTHER EXPERIMENTS**

1. Primiparous does
2. Farms with lower female reproductive performance (60-70% calving rate)
3. Exocrine glands as a source of pheromones
4. Pheromone biostimulation methods in male performance (sexual drive and sperm production and quality)



## TAKE HOME MESSAGE

Even though little research has been done in the field, biostimulation methods based on chemical communication are a potential powerful tool to improve animal production and welfare



# THANK YOU!