Analysis of the interactions between productive, nutritive and reproductive parameters from an experimental flock of Latxa dairy sheep

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INTRODUCTION

IMPORTANCE OF REPRODUCTIVE SUCCESS

FERTILITY → PRODUCTION → PROFITABILITY
Planning the productive schedule
Fit requirements and availability of resources
Labour organization

ON DAIRY SHEEP BREEDING SCHEMES

- Increase selection pressure (with Artificial Insemination)
- Constitution of the milking flock
- Milking period length
- % Milked ewes

INTRODUCTION

EXPERIMENTAL FLOCK OF LATXA SHEEP

- R+D Projects (since 1992) :
  Reproduction (AI), nutrition, ethology, milk recording, animal health, management practices environmental, biomedicine, etc.
- 150 adult sheep + 50 yearlings
- 12 has (grazing from March to November)
- Artificial Insemination (100% of adult sheep) in August
- Milking: February to June
  - Milk Recording Program: milk yield
- Body Condition Score (BCS) and Live Weight (LW)

OBJECTIVES

1) To **assess** the effect of

- Age
- Previous lambing type:
  - Success at AI, natural mating, failure etc
- Productive performance:
  - Total milk yield
- Nutritional management:
  - Body condition score (BCS)
  - Flushing

upon **fertility at AI** and **prolificacy** of Latxa sheep

2) To **parameterise** the probabilities of reproductive success at AI according to these factors

MATERIAL & METHODS

REPRODUCTIVE MANAGEMENT

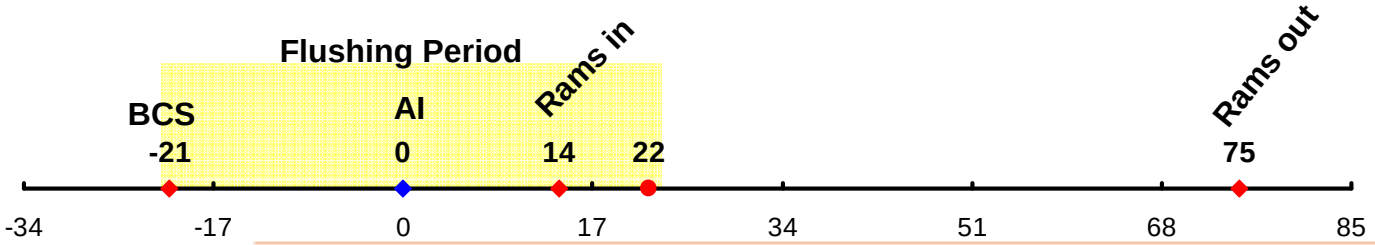
1. Animals assigned to Flushing or No Flushing treatment (BCS measured)

   Flushing during 6 weeks: 200 g Cereal / head / day + Grazing

   Flushing Group { Sheep: BCS < 2.5
   Yearlings: BCS ≤ 2.5

2. Artificial Insemination (AI): cervical, fresh semen, last week of August

3. Natural Mating (14-75 post AI)



MATERIAL & METHODS

DATABASE

- 2000 records from 2000 to 2010 / 684 sheep/ 1735 lambings
- 1768 records of BCS before mating (since 2003)

FEATURES AND CATEGORIES

- **Age:** 1, 2, 3, 4, 5, and ≥ 6 years-old
- **Previous lambing type:**
  1 = Success at AI
  2 = Lambing from 1st cycle after AI
  3 = Lambing from ≥ 2nd cycle after AI
  0 = No lambing
- **Productive performance:**
  - Total milk yield (litres): low (<P_{25}), medium (P_{25} to P_{75}), high (>P_{75})
- **Nutritional management:**
  - BCS: low (< 2.5), medium (2.5 to 3.0), high (≥ 3.0)
  - Flushing (since 2003): yes or no

MATERIAL & METHODS

VARIABLES ANALYZED

- Fertility at AI
- Prolificacy at AI
- Prolificacy at NM

STATISTICAL ANALYSIS (SAS Stat)

- Descriptive
- Chi-square test (X2): Proc FREQ
- Linear Regression for categorical data: Proc LOGISTIC

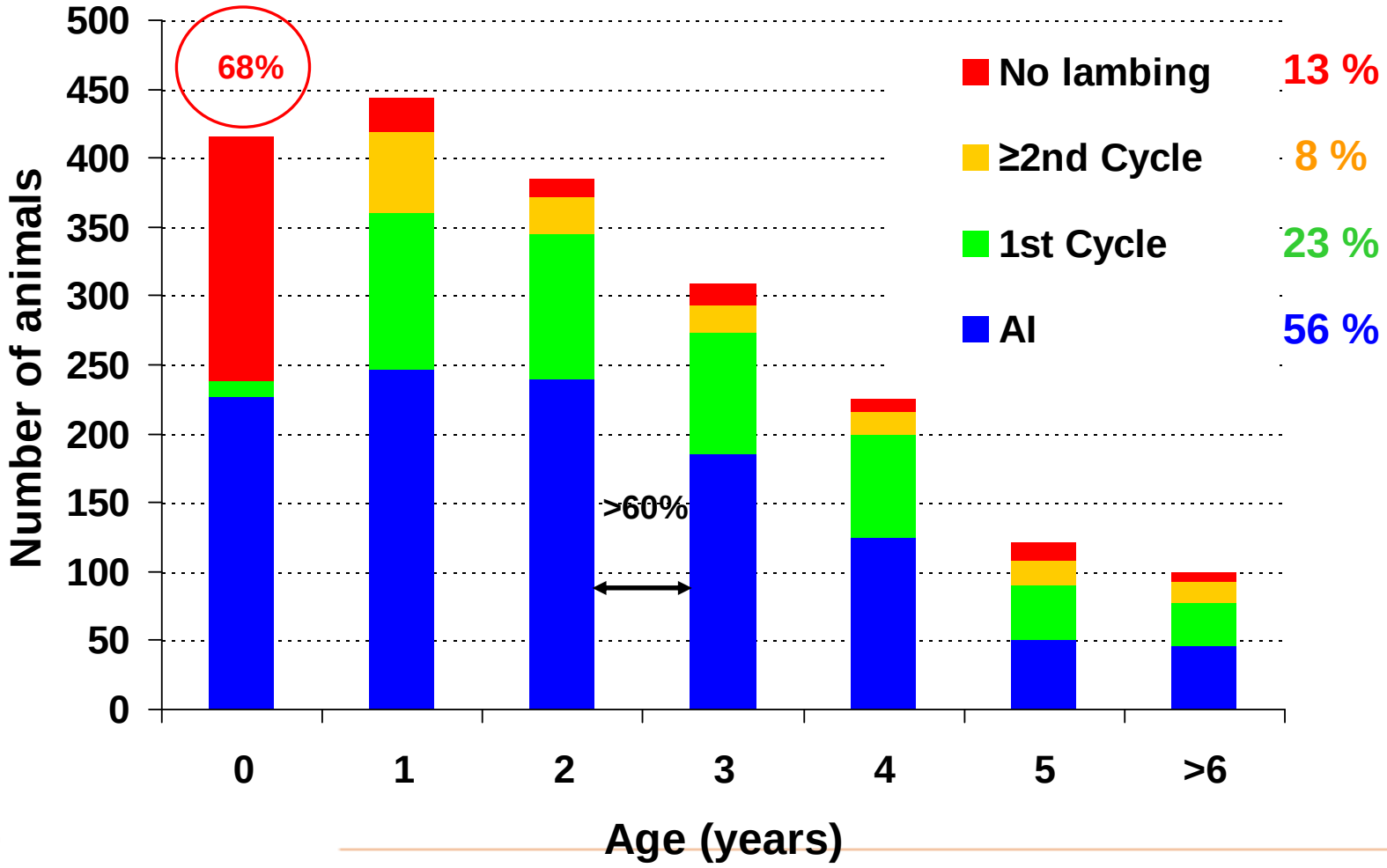
RESULTS

MEANS AND S.D.

– Age (years):	2.12	(± 1.72)
– Weight (Kg):	57.5	(± 8.95)
– BCS:	2.62	(± 0.55)
– Total milk yield (L):	180	(± 55.3)
– Fert. at AI (%):	56.2	(± 6.16)
– Fert. Total (%) (≥1year):	94.8	(± 2.21)
– Prolificacy at AI:	1.55	(± 0.07)
– Prolificacy at NM:	1.43	(± 0.09)

RESULTS

DATA DISTRIBUTION

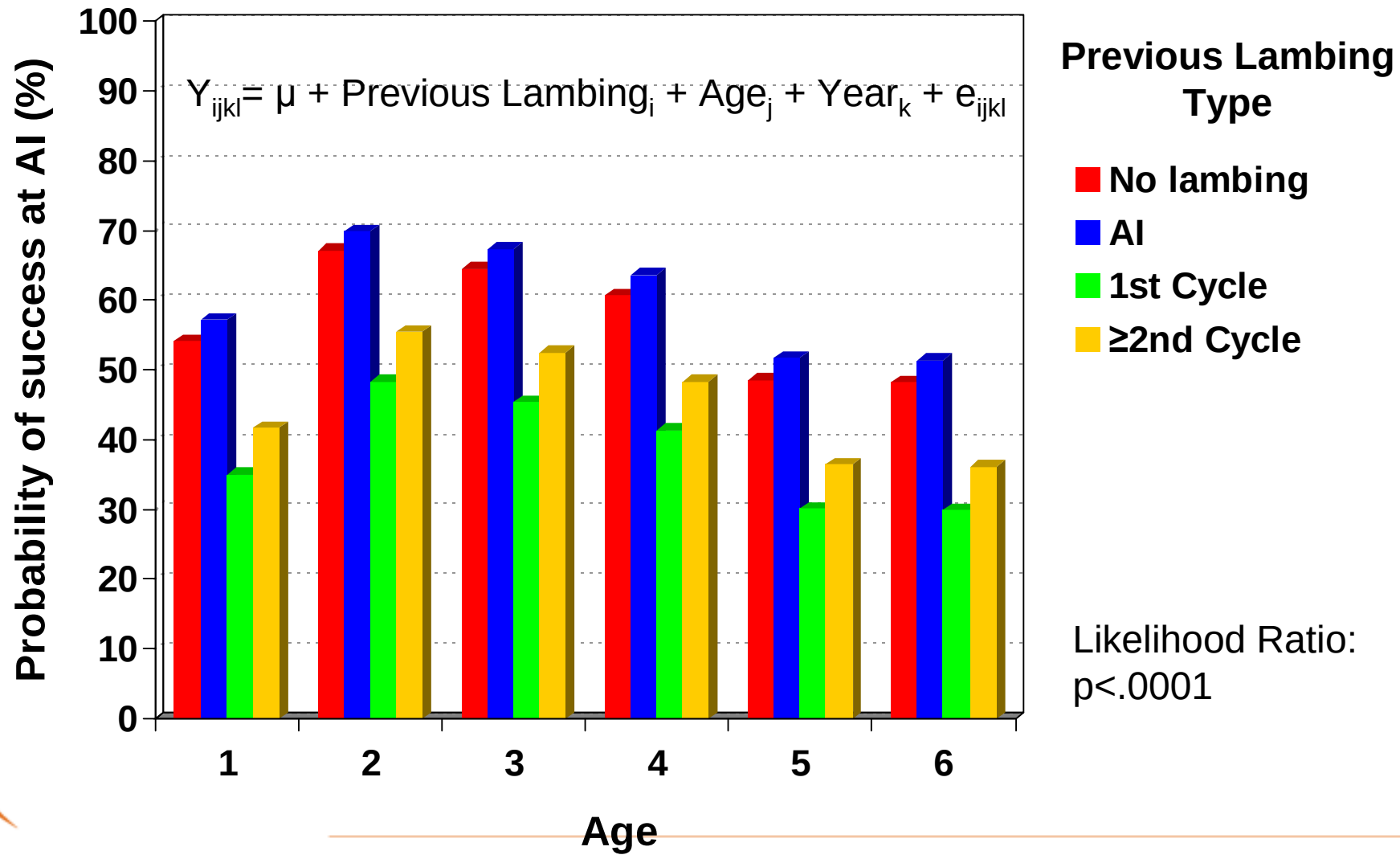


RESULTS

FREQUENCY DISTRIBUTION
- chi-square

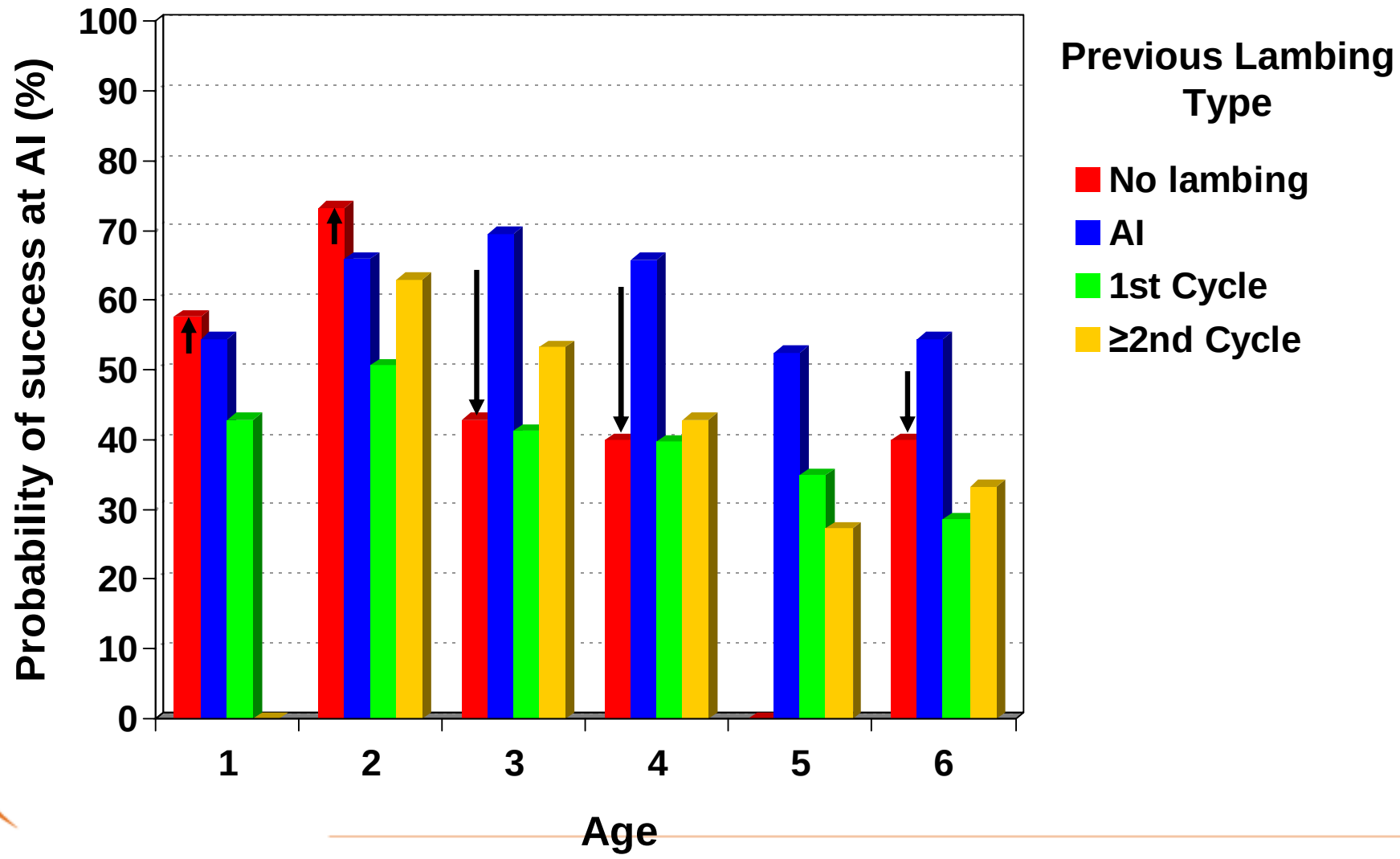
	Fertility AI	Prolificacy AI	Prolificacy NM
PREVIOUS LAMBING TYPE	<0.0001***		
AGE	0.0013**	<0.0001***	<0.0001***
YEAR	0.0029**	0.5133	0.0576
MILK PRODUCTION	0.3337		
BCS	0.8471	0.3163	0.0151*
FLUSHING	0.4159	0.7633	0.0792

PROBABILITY OF SUCCESS AT AI OBTAINED WITH THE LINEAR REGRESSION MODEL

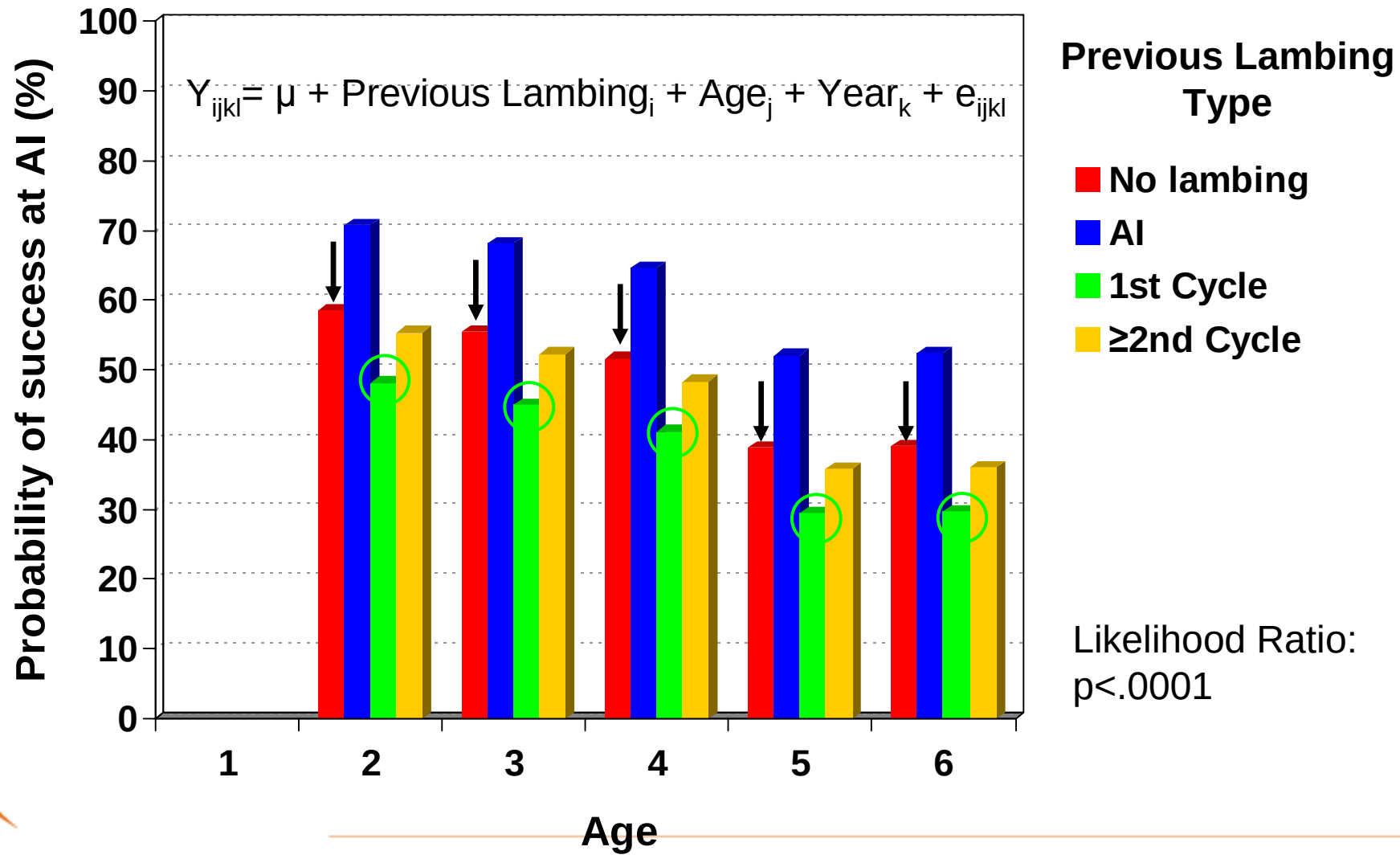


Likelihood Ratio: $p<.0001$

PROBABILITY OF SUCCESS AT AI FROM REAL DATA



PROBABILITY OF SUCCESS AT AI OBTAINED WITH THE LINEAR REGRESSION MODEL WITHOUT 1 YEAR-OLD EWES



Likelihood Ratio: $p<.0001$

CONCLUSIONS

- According to the data available, the age of the sheep and the previous lambing type determines the success of AI in the following season
- Management practices such as flushing determined the absence of differences in the reproductive success of sheep with different BCS
- In order to model the expected success at AI of Latxa sheep, the equation obtained should be validated with data coming from commercial flocks

THANK YOU