MANAGEMENT OF HIGH PROLIFICACY GENES IN MEAT SHEEP:

The ROA allele

iSAGE Training Course and Workshop

INNOVATIONS TO IMPROVE SUSTAINABILITY IN THE SHEEP AND GOAT SECTOR
(Zaragoza, Spain, from 10 to 13 December 2019)
The main goal of the cooperative is to increase the profitability of farms and improve farmers quality of life, providing the best products in terms of quality and safety for the final consumer.
Rasa Aragonesa Breed

Rasa Aragonesa is a local meat sheep breed raised in extensive systems in Aragón.

Phenotypic Prolificacy = 1.37 lamb/birth (17th catálogo selección Upra)

Heritability = 0.034 (Jurado et al., 2008)
### Profit function - Profitability factors

**Prolificacy improving is a Good way to increase the Gross Margin**

<table>
<thead>
<tr>
<th>Increase of 1% in:</th>
<th>Gross Margin Change for sheep</th>
<th>Gross Margin change for UTA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nº births for sheep and year = X&lt;sub&gt;2&lt;/sub&gt;</td>
<td>+ 3.0%</td>
<td>+ 3.0%</td>
</tr>
<tr>
<td>Prolificacy = X&lt;sub&gt;3&lt;/sub&gt;</td>
<td>+ 3.4%</td>
<td>+ 3.4%</td>
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<tr>
<td>% Lambs mortality = X&lt;sub&gt;4&lt;/sub&gt;</td>
<td>- 0.6%</td>
<td>- 0.8%</td>
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<tr>
<td>Average prize of the sold lamb = X&lt;sub&gt;5&lt;/sub&gt;</td>
<td>+ 3.6%</td>
<td>+ 4.3%</td>
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<tr>
<td>€ for feeding for sheep and year = X&lt;sub&gt;6&lt;/sub&gt;</td>
<td>- 2.6%</td>
<td>- 2.7%</td>
</tr>
<tr>
<td>Total laboral cos = X&lt;sub&gt;7&lt;/sub&gt;</td>
<td>- 1.2%</td>
<td></td>
</tr>
<tr>
<td>Sin tratamiento</td>
<td>No ROA</td>
<td>ROA</td>
</tr>
<tr>
<td>-----------------</td>
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<tr>
<td>1,34</td>
<td>1,71</td>
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</tbody>
</table>

- **FecXR ALLELE OF BMP15 GENE**
- **2007 Year:**
- **Female X Male:** $X R \times Y R$
  - **Sterility:**
  - $X^R X^R$
- **Male R®:**
- **Female X Male:** $X X^R$
  - **+0,36 lambs/birth**
We had work on 35 farms with diferente % of ROA sheep in terms of fertility, prolificacy and mortality.

We had analyzed the perception of the inclusion of the ROA gene in herds through surveys.
Perception of the effect of the ROA allele across farms with different proportions of ROA sheep

- Has the prolificay of your flock increased by the presence of the ROA gene?
- Has the number of sold lambs increased since you have ROA sheep?
- Has the profitability of your farm increased since you have ROA sheep?
- Has improved your quality of life since you have ROA sheep?
Perception of the effect of the ROA allele across farms with different proportions of ROA sheep

- I’m happy to have ROA sheep
- I’m going to increase the number of ROA sheep
- There is more mammary disease since I have ROA sheep
Disseminate the allele across interested farms
Prolificacy genes increase farm profitability without increasing flock size or intensifying production.

The ROA allele has been successfully spread across the Rasa Aragonesa sheep population, increasing to those farmers willing and technically prepared to increase prolificacy.
A good genetic management is critical because homozygosity results in sterility.

Key factors are:

1. The identification of animals carrying the allele
2. Strict control of progeny
3. Recording of production data
4. Well-established herd book
5. Genetic analysis of all males
Future potential of the innovation

NEW GENETICS VARIANTS & EARLIEST GESTATIONAL AGE

Joining the best of each one
Thanks for your attention!!