

PROLIFICACY GENES

THE ROA ALLELE



Managing the ROA allele to improve sustainability of Rasa Aragonesa sheep
by increasing prolificacy

2007

In 2007 a new allele of the BMP15 gene was discovered in the Rasa Aragonesa sheep breed. The allele (FecX^R /ROA) was not described before that date.



ROA Oviaragón



FEMALES CARRYING THE FecX^R/ROA IN HETEROZYGOSITY INCREASE PROLIFICACY BY AN AVERAGE OF 0.36 LAMBS PER PARTUM.

Rasa Aragonesa is a local meat sheep breed raised in extensive systems in Aragón, Northeast Spain. It produces a high quality lamb which is marketed under the PGI label "Ternasco de Aragón".

The breed has a well-established breeding programme and an organism that manages the Flock Book, the UPRA. Prolificacy has been managed since 1994. Since its discovery in 2007, the ROA allele has been used to increase prolificacy in Rasa Aragonesa sheep. Artificial insemination is used to disseminate the allele across interested farms.

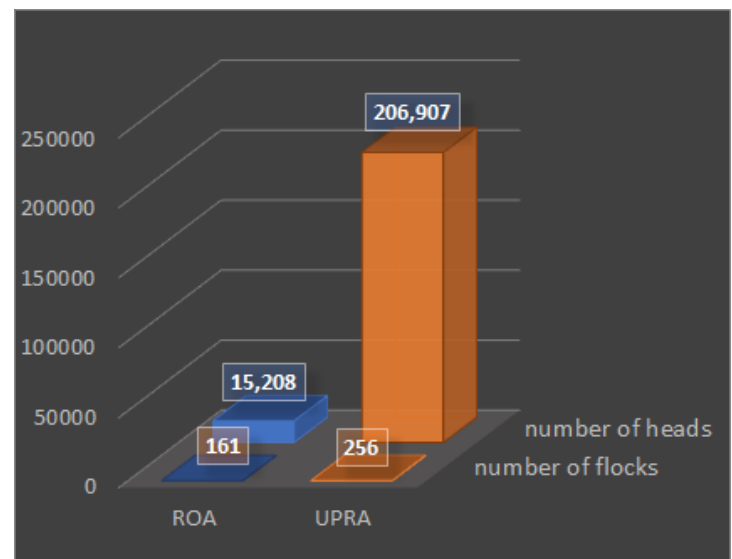


Managing the ROA allele to increase prolificacy in Rasa Aragonesa

Oviaragón

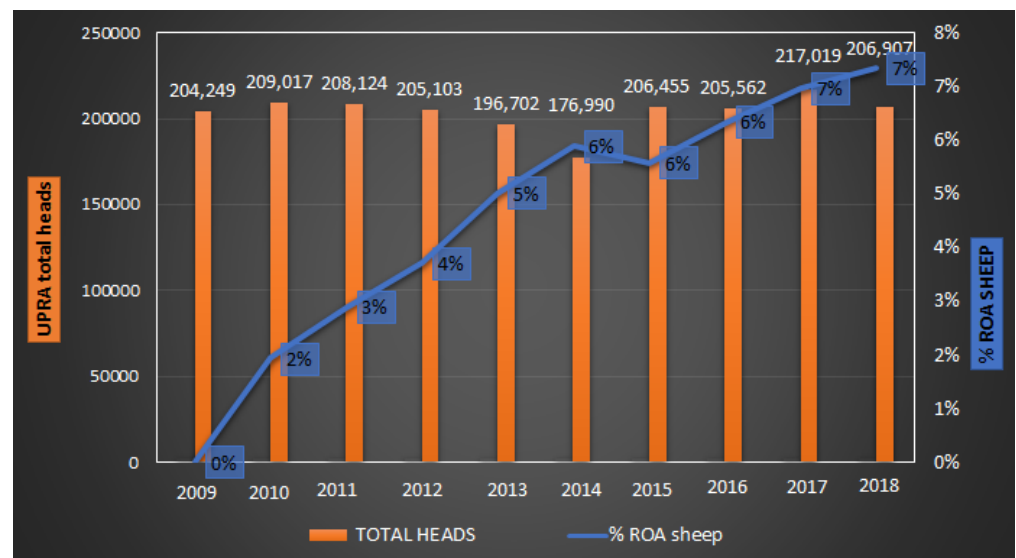
ISAGE FARM ANALYSIS

35 farms with different proportions of allele carrier ewes were analysed in terms of prolificacy, fertility, and lamb mortality. Farmers' perceptions of the effect of the ROA gene on farm results, farm management and overall satisfaction level was also explored



161 FARMS HAVE INCORPORATED THE ROA ALLELE TO INCREASE FLOCK PROLIFICACY

THE NUMBER OF FLOCKS MANAGING PROLIFICACY VIA THE ROA ALLELE IS GROWING EVERY YEAR



GOOD GENETIC MANAGEMENT IS CRITICAL BECAUSE HOMOZYGOSITY RESULTS IN STERILITY. KEY FACTORS ARE:

- THE IDENTIFICATION OF ANIMALS CARRYING THE ALLELE
- STRICT CONTROL OF PROGENY
- RECORDING OF PRODUCTIVE DATA
- WELL-ESTABLISHED FLOCK BOOK
- GENETIC ANALYSIS OF MALES

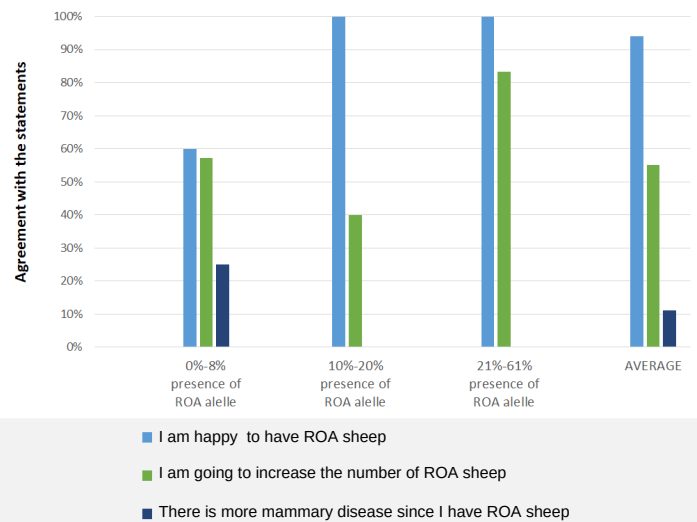
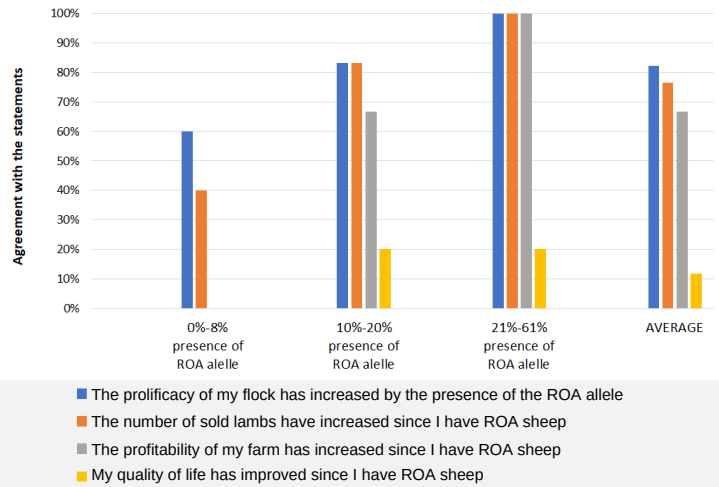
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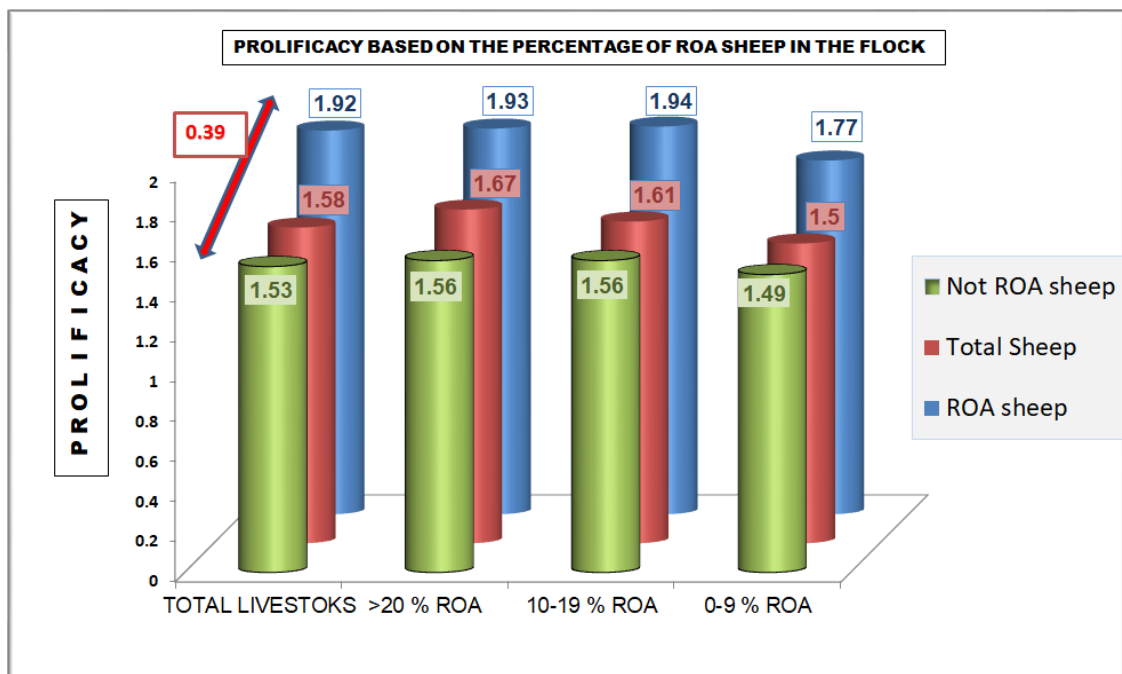
WHAT DO FARMERS WITH MORE THAN 20% OF ROA ALLELE CARRIER EWES IN THEIR FLOCKS THINK?

- They consider that there are more twin lambings than before.
- They observe that they are earlier. This means more lambs per ewe during her reproductive life.
- They consider that they sell more lambs and ROA ewes are more profitable.
- With less, more efficient animals, the same production level (or more) can be achieved using less resources.

Perception of the effect of the ROA allele across farms with different proportions of ROA sheep



PRESENCE OF THE ROA GENE INCREASES LAMBS BORN PER PARTURITION BY 0.39.





INNOVATION AND SUSTAINABILITY

The sustainability of the sheep farms can be achieved by making them economically and socially viable. In this sense by incorporating the ROA allele, profitability can be increased without reducing the use of coarse pastures that are only grazed by sheep. It maintains livestock farming in the rural area thus preventing the abandonment of villages and maintain the surrounding landscape.

**1**

The ROA allele has been successfully spread across the Rasa Aragonesa sheep population increasing to those farms willing technically prepared to increase prolificacy

2

The ROA allele increases prolificacy without increasing fertility or lamb mortality

3

Farmer management of twin lambings and attention to lambs to avoid mortality are key to make the most of the introduction of the ROA allele in the flock

4

Genetic management at farm and population level is key to avoid downsides of the ROA allele related to infertility caused by homozygosity

PROLIFICACY GENES INCREASE FARM PROFITABILITY WITHOUT INCREASING FLOCK SIZE OR INTENSIFYING PRODUCTION

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