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Genetic relationship between ewe lamb growth and adult ewes liveweight

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INTRODUCTION

Question addressed by breeders:

since growth is a selection criteria in the selection nuclei,
can a tendency to increase adult liveweight be avoided ?

Increase of liveweight means increase of maintenance nutrition
requirements and is not wanted by breeders

Study with data of our experimental farm :

- evolution of adult liveweights from 1990 to 2010
- relationship with ewe lamb growth



Material and methods

- ❑ experimental flock of la Sapinière near Bourges (Centre of France)
- ❑ Romane “INRA-401” breed, cross between prolific Romanov 50% and terminal Berrichon 50%, synthetic line obtained in the 70’s and diffused in commercial farms as a new breed
- ❑ data concerning the liveweight collected by automated weightings
 - at weaning at 70 days,
 - at selection for replacement at 120 days
 - at matings and at lambings (adult liveweights)
- ❑ data collected on 9671 ewes with
 - 49 846 adult liveweights from 1990 to 2010

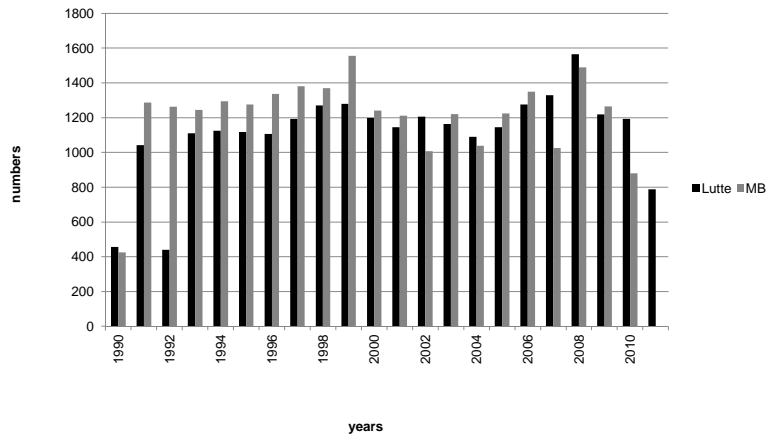


Automatic weighting at lambing

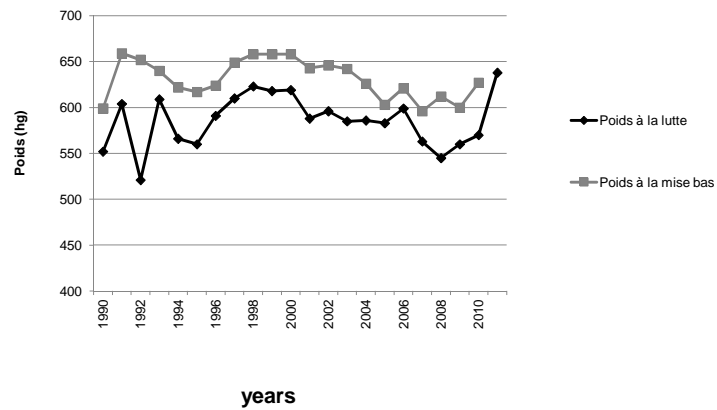


Results

Analysis of ewes liveweights data for 20 years (1990-2010) for this flock



raw mean weights at mating (black) and at lambing (grey)



adjusted means with a model age, year, (weak interaction age*year)

for mating weight : a decrease from 66.5 kg in 1990
to 55kg in 2008 and 56 kg in 2009 (58 kg in 2010)

for lambing weight: 66 kg in 1990, 61 kg in 2009

Is it only phenotypic ?
What about the genetics of the liveweight ?

On our data set, heritability of Adult Liveweight was 0.53

Fogarty *et al*, 1995:
0.41 to 0.57 wool breeds,
0.25 to 0.30 terminal breeds
Charolais cattle 0.61 (Vinet *et al*, 2005)

That means that the straight reduction is due to environmental effect

In fact, it is due to more focused feeding all along the year

relationship with ewe lamb growth

selection of young rams on growth index based on ADG 90-150 d

With our ewe lambs data,
heritability of Average Daily Gain between 70 and 120 days was 0.24

and genetic correlation between Average Daily Gain between 70 and 120 days, and Adult Liveweight was 0.83

So genetic progress on growth leads to genetic progress on adult liveweight

Genetic correlation between weaning weight & adult weight 0.75 in
australian merino (Safari *et al*, 2004)
In Charolais cattle 0.55 (Vinet *et al*, 2005)

Conclusion

To prevent increase of liveweight in such a context and despite of genetic progress,
management of ewes (adult & replacement) must tend to reduce environmental effect in particular feeding (nutrition).



Thank you for listening

