

## PARAMETERS AND TRENDS FOR BIRTH WEIGHT CRITERIA IN HYCOLE D LINE

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### INTRODUCTION

Our study aims to define one or more **heritable criteria to improve weight and homogeneity of weight of young rabbits at birth**, while limiting the number of measures to achieve. The second part of the study presents the **progress achieved** with the selection on the weight of the lightest rabbit in **HYCOLE D line**.

### MATERIAL AND METHODS

#### • Estimation of genetic parameters

- **2108 litters measured** from December 2009 to September 2010 on total weight of the litter (**TW**), weight of the lightest rabbit (**MIN**), weight of the heaviest rabbit (**MAX**) and number of rabbits born alive (**BA**). The range of weight between the lightest rabbit and heaviest rabbit (**Range**) and the average weight of each litter (**AW**) were calculated.
- Estimation with the REML method applied to an animal model using ASReml.

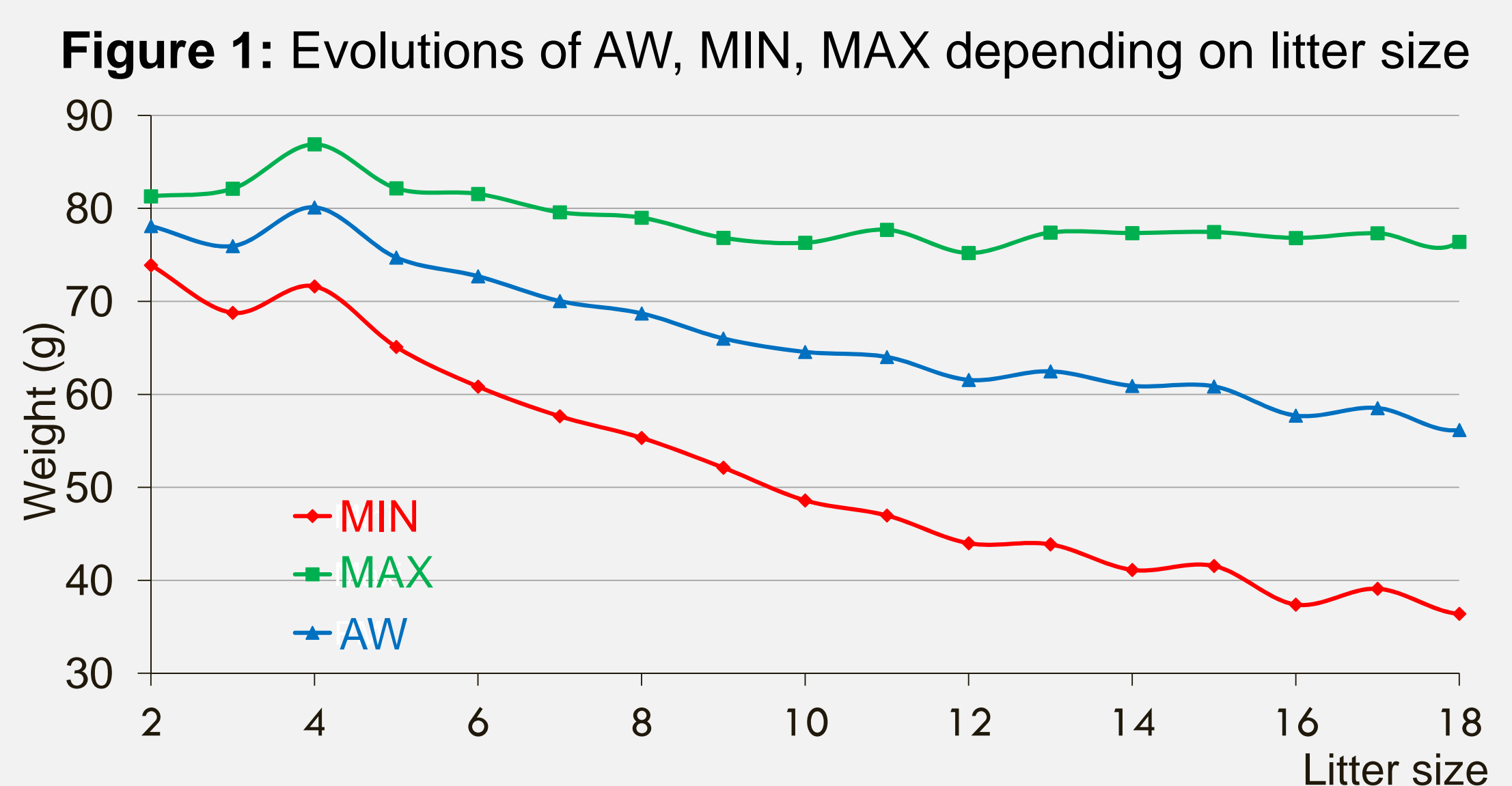
#### • Genetic trends

- Selection with a multi-traits breeding objective (5 traits) including the trait **MIN** from September 2010 to February 2012. **7219 litters measured for the criterion MIN**.
- Estimation of the breeding value by BLUP with ASReml.

### RESULTS AND DISCUSSION

#### • Effect of the litter size

The increase in the number of rabbits per litter caused a decrease of the average weight of young rabbits (Figure 1). The weight of the heaviest (MAX) is moderately influenced by the litter size. The weight of the lightest (MIN) decreases continuously with the increasing number of rabbits. **An additional rabbit will decrease the weight of the lightest rabbit of 2.5g (r=0.97).**



#### • Genetic parameters

The **heritability values** (Table 1) are ranged **between 0.08 and 0.14**, consistent with the literature. **These criteria have a significant genetic variability, allowing improvement by selection.**

The genetic correlations are favourable between the different criteria of weight and between TW and BA. Genetic correlations are unfavourable or non-significant between AW, MIN, Range and BA. The criterion Range is negatively correlated with all weight criteria except MIN: **improvement of the weight of the lightest rabbit tends to reduce the range of within-litter weight.**

**Table 1:** Genetic parameters of AW, TW, MIN, MAX, Range and BA.

	AW	TW	MIN	MAX	Range	BA
AW	<b>0.14</b>	0.07	<b>0.83</b>	0.96	ND	-0.05
TW		<b>0.14</b>	<b>0.77</b>	0.94	<b>0.58</b>	<b>0.75</b>
MIN			<b>0.08</b>	<b>0.44</b>	<b>-0.39</b>	-0.22
MAX				<b>0.13</b>	<b>0.64</b>	0.22
Range					<b>0.11</b>	<b>0.33</b>
BA						<b>0.10</b>

*Heritability estimates on the diagonal and genetic correlations above the diagonal. Standard deviation for heritability and correlation estimates were equal or lower than 0.05 and 0.31 respectively. ND: not determined value.*

#### • Genetic trends

Selection on the criterion MIN allowed a **genetic gain of 0.9 g of weight for the lightest rabbit** for animals born in 2011 compared to those born in 2010.

### CONCLUSION

A direct selection is possible on several criteria of weight measured from the litter at birth. The criterion **MIN is favourably correlated with Range as well as other weight criteria**. The introduction of the criterion MIN into the breeding objective showed a **significant genetic evolution after 18 months**.