



# MC4R and FUT1 genes in sows of Large White breed in the Czech Republic

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## Introduction:

A porcine melanocortin 4 receptor (*MC4R*) variant (Asp298Asn) on pig chromosome 1 is considered to be economically important. The *MC4R* gene has been associated with feed intake, fatness and growth traits in several commercial populations.

The oedema disease and post-weaning diarrhoea in 4-12 weeks old pigs is associated with the colonization of the small intestine by toxigenic *Escherichia coli* strain with fimbriae F18. The *FUT1* gene has been determined as a marker gene for *E. coli* F18 receptor locus. The M307 polymorphism of the *FUT1* gene influences susceptibility to adhesion of *E. coli* F18 to intestinal mucosa and an outbreak of illness.



**Figure 1:** Porcine chromosome No. 1 and 6

## Material and methods:

- ✂ The main objective of this study was to analyse the association of *MC4R* polymorphism with back fat and proportion of lean meat and the association of *FUT1* gene with death loss of piglet.
- ✂ There were analysed 73 sows of Czech Large White (CLW) breed with benefit litter size. Samples of blood of pigs were analysed by PCR-RFLP methods.

## Results:

**Table 1:** Frequency of genotypes (%) *MC4R* and *FUT1* genes

| CLW sows | Number of sows | <i>MC4R</i> |    |    | <i>FUT1</i> |    |    |
|----------|----------------|-------------|----|----|-------------|----|----|
|          |                | AA          | AB | BB | AA          | AG | GG |
|          | 73             | 44          | 52 | 4  | 4           | 26 | 70 |

**Table 2:** Association of *MC4R* gene with back fat and proportion of lean meat

| CLW sows | <i>MC4R</i> genotype | Average height of back fat (mm) | Average proportion of lean meat (%) |
|----------|----------------------|---------------------------------|-------------------------------------|
|          | AA                   | 9.08                            | 60.94                               |
|          | AB                   | 8.01                            | 61.88                               |
|          | BB                   | *                               | 61.27                               |

**Table 3:** Association of *FUT1* gene with death loss of piglet

| CLW sows | <i>FUT1</i> genotype | Death loss of piglet on the first litter (piglets) | Death loss of piglet on the second and the subsequent litters (piglets) |
|----------|----------------------|----------------------------------------------------|-------------------------------------------------------------------------|
|          | AG                   | 3.16                                               | 2.28                                                                    |
|          | GG                   | 2.29                                               | 2.51                                                                    |

## Summary:

Frequencies of genotypes of marker *MC4R* were: AA 0.44; AB 0.52; BB 0.04. Average height of back fat (mm) was: AA 9.08; AB 8.01. Average proportion of lean meat (%) was: AA 60.94; AB 61.88; BB 61.27.

Frequencies of genotypes of marker *FUT1* were: AA 0.04; AG 0.26; GG 0.70. Death loss of piglet on the first litter was: AG 3.16 and GG 2.29 piglets. Death loss of piglet on the second and the subsequent litters was: AG 2.28 and GG 2.51 piglets.