

PRACTICE ABSTRACT 10

Metabolomics to identify markers for heat stress tolerance in pigs

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WP3:
Re-Breeding
livestock for
resilience

Breeding for heat stress tolerance in pigs needs novel phenotypes

Heat stressing conditions are expected to be much more frequent in the coming years in many parts of the world. **Heat stress in pigs** is not beneficial at all: it causes **production losses** and increased **production costs**. For example, pigs that are not tolerant reduce **feed intake** and therefore worsen **growth rate** and **sows reduce reproduction performances**. Therefore, we need to breed more resilient pigs, that can better cope with this problem. But how we can do that? To proceed with this aim, we first need to answer another key question: What are the **phenotypes** that we can explore to understand the genetic components of heat stress tolerance in the pigs? To reply to this challenging question, **Re-Livestock** is going to dissect the very basic biological processes underlying **heat stress response** in pigs by analysing **hundreds of molecular phenotypes, the metabolites**, that are present in the blood.

Metabolomics applied in pigs can provide novel genetically determined markers

For many metabolites, their level in the blood is **genetically determined**. The metabolites are analysed used an analytical approach, called **metabolomics**. **Re-Livestock** is applying, for the first time, **high throughput metabolomic analyses** in a large pig population, including different breeds and lines. The obtained information is used to identify **novel markers** linked to the **genetic background** that explain the physiological adaptation of the animals to the heat conditions of the animals.

The experimental designs that **Re-Livestock** has set up have already demonstrated the feasibility of this approach and promising results have already been obtained.

Assessing Public Goods Provision with Re-Livestock Tool

Based on that, we can say that metabolomics can provide useful information to **re-design pig breeding** to **increase tolerance** to **heat stress** conditions and **improve welfare of the animals**.

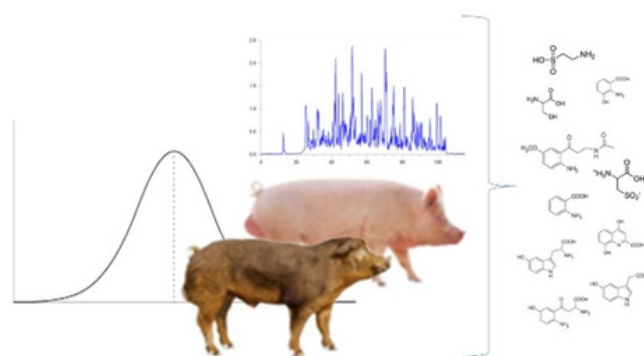


Figure 1. Metabolomics can help to identify tolerant pigs to heat stress.