

## **Towards a systemic use of precision livestock measures and precision phenotyping in dairy herds**

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This talk attempts to build some arguments for the benefits of placing precision livestock measures in a systemic context. At present, it is generally the case that precision livestock solutions are developed for the purposes of monitoring a particular condition, and very often using only one measure. Whilst there may be sound commercial or applicability reasons for doing this, there is almost always not full mapping of the condition of interest onto the measure being used to monitor it. This is true even in the case of using milk progesterone to monitor reproductive status. It then follows that combinations of precision livestock measures may fruitfully be combined to get a fuller, and more robust, description of the condition. Such combinations may be considered both as combinations of full continuous signals (e.g. milk yield and electrical conductivity, etc) or as sequential combinations. Sequential combinations are those where a cheap easy to deploy but usually less precise signal is used to provide first level monitoring but is set up to initiate a second level, more precise, and usually more expensive, monitoring when the first indicator indicates change from the normal state. Combined measure can also provide new more finessed definitions of the condition being monitored when they are combined with a systemic view of the condition be studied. An example of this is the concept of “degree of infection” which has recently been developed for mastitis. The final issue addressed by the talk is the use of precision livestock measures for phenotyping, as opposed to monitoring. This is becoming increasingly important in the context of addressing more complex traits such as robustness in genomic selection, and also when considering herd level resilience.

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