

How to conduct flavour preference trials in dairy cows

Feed flavours are additives that are being increasingly used in animal nutrition as a tool to enhance both the smell and taste of feed, in order to improve feed intake. It is generally observed that a higher feed intake in animals leads to improved performance and consequently a higher return on investment.

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This potential of flavours to enhance feed palatability and thus intake has generated a tremendous amount of interest in such additives. Livestock animals, and more particularly ruminants, have demonstrated sensitivity to variations in the smell and taste of the feed they are given, which directly influences their feeding behaviour.

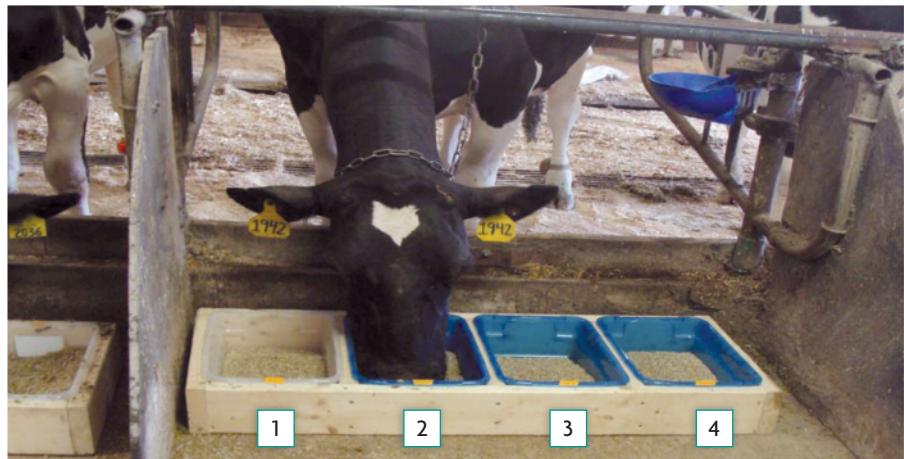
Higher feed intake in dairy cows has been shown to improve energy balance during the early lactation period, and higher milk yield in the mid-lactation phase. Dairy farmers usually choose flavours that they believe are preferred by cows.

Objective assessment

A preference test or choice experiment is a method to objectively assess animal preferences for different types of flavours.

By definition, a preference test is an experiment in which animals are exposed to several conditions, each differing in one or more variables. This type of test is often used to compare different feeds and the effect of each type of feed on consumption and preference. The selection of a specific type of feed by the animal is obviously driven by preference, but one has to bear in mind that this is limited to the options of available feed. This means that in a test where several different flavoured feeds are offered, higher consumption of a specific flavoured feed does not imply that the animal likes that particular flavour, but that it is preferred among the available flavours.

To get useful results, a preference trial has



An example of poor feed tray positioning in a preference trial.

to be carefully set up. First of all, the parameters to be measured should be relevant. In most cases, feed intake is a key parameter that is assessed in trials to determine flavour preference.

Depending on the conditions (indoor or outdoor trial), it might also be useful to measure the period of time the animal spends consuming the feed.

For other types of products (sweeteners, bioactives, etc), it may be important to measure secondary response variables such as metabolism, milk yield, and milk composition. Different techniques can be used to assess feed intake and animal behaviour in indoor trials, including direct observation, video or photographic recording. In any case, one must ensure that the animal is not disturbed by the measurement.

The design of the area where the different types of feed are given to the animal is also important. It is possible that the lack of space around some of the feed trays can distort results. An example of poor feed tray positioning can be seen in the picture above, in which feed in the side trays (trays 1 and 4) was consumed much less than the feed in the middle trays.

To alleviate any position bias in the results, a proper rotation of the feeds between the different tray positions should be planned. This would also avoid the natural preference of animals for any one position. The size of the bins should also be

adapted to the size of the animal's muzzle. Undersized bowls would thus make it difficult or even impossible for cows to eat.

Hunger is a disruptive factor in tests as hungry animals tend to eat whatever is given to them, without demonstrating a genuine preference. Therefore it is advised to run the trials once the animals have been already fed. An acclimation period that will allow animals to adjust to the conditions of the experiment is also recommended.

Assessing palatability

For palatability assessments, an adaptation period to the feed of more than one day is necessary. In case of preference tests comparing different flavours with a neutral control, the feed should not be the one the animals are used to eating.

Previous exposure to feed is known to have an influence on preference and intake. The number of animal replicates is often between six and eight per treatment for indoor experiments. In addition, the number of treatments generally varies from 2-10 for indoor trials. In addition to numerous sensory evaluation tests performed by in-house panelists, Pancosma always validates its palatant creations with appropriate animal trials. Animal palatability trials are always complex to perform. It is therefore crucial to pay rigorous attention to obtain accurate and reliable results.