

Dr. Lucie Decoeur \* Dr. Steve Dorais \* Dr. Marc Levesque \* Dr. Éloïse Molgat

**March 2022**

## **Using Fiber and Manure to Evaluate the Effectiveness of Your Feeding Programs**

### **Penn State particle separator: evaluation of the ration fed to cows**



The Particle Separator is used to measure forage and Total Mixed Ration (TMR) particle size on the farm. It then allows us to judge the physically effective fiber (% peNDF), the sorting, and the mechanical action of the harvester or mixer.

Physically effective fiber plays 2 important roles at the rumen level. Nutritionally, the good rumen bacteria (flora) need fiber as food. Functionally, the fiber stimulates chewing, salivation and rumination. This way, fiber maintains the ruminal pH (prevents ruminal acidosis) and a normal feed transit rate. Fiber feeds the rumen, and ensures good general health, optimal digestion, and maximum feed consumption. A lack of fiber is a risk factor for abomasal displacement (DA) and also subacute rumen acidosis, which exacerbates, among other things, lameness (hemorrhages and sole ulcers) and abomasal ulcers. Excess fiber reduces ingestion capacity (full rumen), which explains sub-optimal milk production.

The efficiency of the fiber depends mainly on the length of the particles ( $\geq 8$  mm), hence the interest of using Penn State as the first diagnostic test. If the length of the particles is suitable, then it is rather necessary to evaluate the type of plant and its maturity, the method of preservation (% humidity), the sequence of meals, etc.

The Penn State test is easily done on the farm. A sample of the fed ration is deposited in the top drawer and the box is shaken to separate the particles according to their size. The proportion of particles retained on the 2 upper trays corresponds to the physical efficiency factor (pef) which is multiplied by the quantity of NDF provided by the analysis of the ration. Ideally the peNDF represents 22-24% of voluntary dry matter intake, and the NDF 28-32%.

### **Cargill manure particle separator: evaluation of the ration consumed by cows**

The evaluation of the manure allows us to evaluate the functionality of the rumen and the digestibility of the feed in the ration. When there is a lack of effective fiber and/or when the feed lacks digestibility, the food transit is faster than normal. Then longer sized and/or poorly digested particles end up in the manure.

The Cargill test is just as easily done on the farm. A sample of manure from several cows is washed and filtered through the 3 sieves. Ideally the majority of the particles should end up on the bottom sieve ( $> 50\%$ ). The presence of large particles or whole grains in the top sieve is abnormal and may be caused by insufficient rumination, improper fermentation, recent change in ration, sorting, improper/lack of grain processing, etc.

