# Instructions for using the particle separator

This manual can be used for corn silage, haylage and TMR/PMR

## Step 1: Shaking

Rations must be more than 40% dm.

- ✓ Pile up the sieves in **alphabetical order** with sieve A on top.
- ✓ Take 200 to 300 gram forage. This is approximately a half foragescoop.
- ✓ Divide into the top sieve
- ✓ Shake the particle separator as follows:
  - **5 x** horizontally from front to back on a flat surface
  - **Quarter turn** en repeat movement (see figure 1)
  - Repeat this procedure **8 times**
  - **Approx. 1 movement from front to back per second** over about 17 cm of length

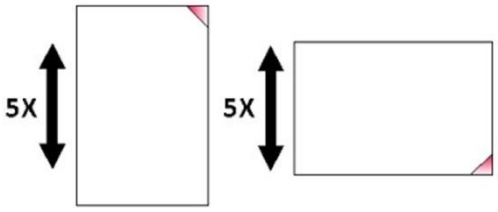

Figure 1: shake pattern for particle separator

## Step 2: Weighing

- ✓ Weighing the amount of forage per sieve accurately with the scales
- ✓ Record the weights per sieve(A, B, C en D) without the weight of the foragescoop
- ✓ Make the following calculation:

**A+B+C+D=T(otal)**

Convert to percentages:

A/T x 100%= %  B/T x 100%= %  C/T x 100%= %  D/T x 100%= %

## Step 3: Compare

### Recommended distribution of particles PMR with 1,18 mm sieve

| | Upper sieve 19 mm | Middle sieve 8 mm | Lower sieve 1,18 mm | Bottom |
|---|---|---|---|---|
| Corn silage[1] | Min. 3% | 45-65% | 30-40% | 5% |
| Haylage | 10-20% | 45-75% | 20-30% | Max. 5% |
| PMR | 6-10% | 30-50% | 30-50% | Max. 20% |

Reference: Evaluating particle size of forages and TMRs using the PSPS

1 The more corn silage in the total ration how more particles must be in the middle sieve

### Recommended distribution of particles TMR with 4 mm sieve

| | Upper sieve 19 mm | Middle sieve 8 mm | Lower sieve 4 mm | Bottom |
|---|---|---|---|---|
| Corn silage[1] | 3-8% | 45-65% | 20-30% | <10% |
| Haylage | 10-20% | 45-75% | 30-40% | <10% |
| TMR | 2-8% | 30-50% | 10-20% | 30-40% |

Reference: Evaluating particle size of forages and TMRs using the PSPS

1 The more corn silage in the total ration how more particles must be in the middle sieve

If you would like to check up if the cows are selecting the ration, you can use the particle separator 3 times during the day. The amount per sieve during the day may not differ more than 5%. Use “analysis particle size (serie)”.

## Advice

| Forage: Corn silage | | |
|---|---|---|
| **Output** | **Result** | **Advice** |
| Too much particles in upper sieve | More chance of heat in stock | Fine harvesting |
| Too much particles in lower sieve and bottom pan | More chance of rumen acidosis | Coarse harvesting |
| Whole grain | Less utilization of the corn silage | Crunch corn grain better |

| Forage: Haylage | | |
|---|---|---|
| **Output** | **Result** | **Advice** |
| Too much particles in upper sieve | More chance of selection | Fine harvesting/cutting |
| Too much particles in lower sieve and bottom pan | Less utilization and more chance of rumen acidosis | Coarse harvesting/cutting |

| TMR/PMR | | |
|---|---|---|
| **Output** | **Result** | **Advice** |
| Too much particles in upper sieve | Selection of the ration, higher chewing frequency >100 chewing per burp, slow passage in the rumen | Fine harvesting of the forage |
| Too much particles in lower sieve and bottom pan | Rumen acidosis, low milk fat | More length/ coarse forage |

| If the cows…. | | |
|---|---|---|
| | **Result** | **Advice** |
| Are **selecting** the ration but the particles are **well distributed** | Not all cows can eat the balanced ration. Cows lower in rank eat less concentrate/ fine particles | **Dry ration >45% dm:** Add water or fodder with low dm.<br>**Wet ration <40% dm:** Change sequence of load/feeding. |
| Are **selecting** the ration. **Too much particles in lower sieve/bottom pan** | Less coarse forage in the rumen, less utilization of protein and energy, rumen acidosis, low milk fat | **Dry ration >45% dm:** Add water or coarse/long forage with low dm.<br>**Wet ration <40% dm:** Add more coarse/long forage with high dm like hay or straw |
| Are **selecting** the ration. **Too much particles in upper sieve** | Cows can easily select the ration, chewing frequency >80 → slow passage in the rumen→ less dm-intake→ negative energy balance possible | **Dry ration >45% dm:** Add concentrate/ fine fodder with low dm<br>**Wet ration <40% dm:** Add concentrate/fine fodder with high dm |

**With the particle separator you can only determine the length of the particles not the puncture in the rumen**