Corn Grain Particle Size Guidelines

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January 2021

Feed Type	Parameter	Mean	Median	Goal*	Minimum
Dry Ground Corn Grain	Mean particle Size (MPS), micron	460	391	255	665
Dry Ground Corn Grain	Surface area, cm^2 per gram	220	200	325	125

**The Goal and Minimum correspond to the 15th and 85th percentile values for more than 400 corn grain particle size measurements conducted since May 2020, at Rock River Laboratory, Inc.*

Notes:

- Corn grain particle size is known to affect rumen and total tract starch digestion by dairy cattle.
  - For each 100 unit decrease Mean Particle Size, rumen starch digestion can increase by 2 percentage units (Goeser and Shaver, 2020)
    - For example, 300 vs 600 micron MPS can account for 6 units difference in rumen starch digestion.
  - Similarly, for each 10 unit gain in Surface Area, rumen starch digestion can increase by 2 percentage units (Goeser and Shaver, 2020)
  - Improved rumen starch digestion is known to improve milk production and feed conversion efficiency and reduce fecal starch content.
- Rock River Laboratory updated the grain particle size protocol and method in May 2020, following recommendations from Kalivoda et al. (2017)
  - The current guidelines correspond to only samples analyzed with the improved protocol.
  - Results for samples analyzed prior to May 2020 do not correspond to these guidelines.

References:

- Goeser, J.P and R.D. Shaver. 2020. Commercial ground corn grain samples vary in particle size metrics and in situ rumen starch digestibility. Applied Anim. Sci. 36:610–614.
- Kalivoda, J.R., C.K. Jones, and C.R. Stark. 2017. Impact of Varying Analytical Methodologies on Grain Particle Size Determination. J Anim. Sci. 2017.95:113-119

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