

Mold, Yeast and *Clostridium perfringens* Guidelines for Agricultural Feeds and Total Mixed Rations

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Revised May, 2016

Feed and Total Mixed Ration Colony Forming Unit Counts / g Feed (as-fed)

Mold Enumeration, CFU/g

Feed	Corn Silage	Legume/Mixed Forage	Corn Grain	TMR
Mean	565,000	264,000	956,000	316,000
Median	2,000	2,000	100,000	70,000
Goal* (15th Perc.)	< 1,000	< 1,000	< 1,000	< 2,000
Upper Limit (85th Perc.)	300,000	100,000	1,700,000	400,000

Yeast Enumeration, CFU/g

Feed	Corn Silage	Legume/Mixed Forage	Corn Grain	TMR
Mean	6,058,000	1,218,000	7,375,000	5,942,000
Median	270,000	10,000	1,300,000	1,800,000
Goal (15th Perc.)	< 1,000	< 1,000	< 20,000	< 200,000
Upper Limit (85th Perc.)	14,700,000	1,000,000	20,900,000	13,600,000

Clostridium perfringens Enumeration (spore counts)**, CFU/g

Feed	Corn Silage	Legume Silage	Grass/Small Grain Silage	TMR***
Mean	500 to 700	70,000 to 90,000	4,000 to 6,500	800
Median	50 to 100	50 to 100	150 to 350	100 to 150
Goal*	< 50	< 100	< 100	< 100
Upper Limit (Near Max)	20,000	>30,000,000	70,000	> 10,000

*The table lists Goals and Upper Limits built from population statistics generated from over 11,000 commercial observations submitted for yeast and mold colony forming unit enumeration (CFU count) in the U.S. since 2010.

***The table lists Goal and Upper Limits built from limited population statistics (n < 250, over two years) and guidance offered by 2001 Food Standards of Australia and New Zealand (Accessed online, Nov. 2015). C. perfringens has been implicated as a bacteria negatively affecting gut health (Dennison et al., 2002).*

****Total mixed ration guidelines are estimates based on limited sample analyses population data (n < 200) and butyric acid bacteria spore count values adapted from Vissers et al. (2007).*

Disclaimer: Many factors beyond feedstuff mold, yeast and C. perfringens affect animal performance. Rock River Laboratory cannot be held responsible in any way for any management decisions, performance, or actions taken following delivery of Rock River Laboratory mold, yeast or Clostridia perfringens count results.

References

Bryan, K.A. 2015. Personal Communication.

Dennison A.C., VanMetre D.C., Callan R.J., Dinsmore P., Mason G.L., Ellis R.P. 2002. Hemorrhagic bowel syndrome in dairy cattle: 22 cases. J. Am. Vet Med. Assoc.: 221:686-689.

Vissers, M.M.M., F. Driehuis, M.C. Te Giffel, P. De Jong, and J.M.G. Lankveld. 2007. Concentrations of Butyric Acid Bacteria Spores in Silage and Relationships with Aerobic Deterioration. J. Dairy Sci. 90:928-936.

Whitlow, L.W., 2014. Personal Communication.

Australia New Zealand Food Standards Code, 2001. Guidelines for the microbiological examination of ready-to-eat foods. Accessed online, Nov. 2015. <http://www.foodstandards.gov.au/publications/pages/guidelinesformicrobi1306.aspx>.