

Randomness Rules:

Living with Variation in Feeds



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Unbreakable Law of Sampling:

You never know
the true value
of anything !



Sampling



20 tons

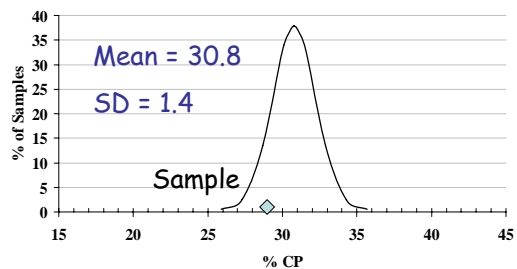


2 lb (1/20,000)
0.005%



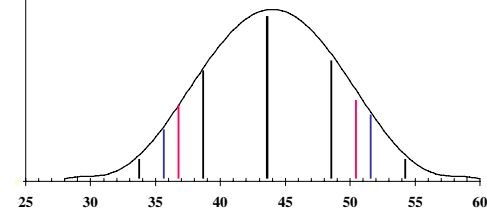
1 g (1/18,000,000)
0.000006%

Feed 'X' CP



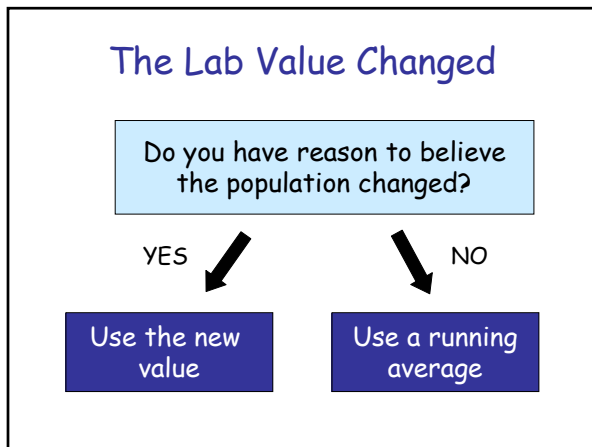
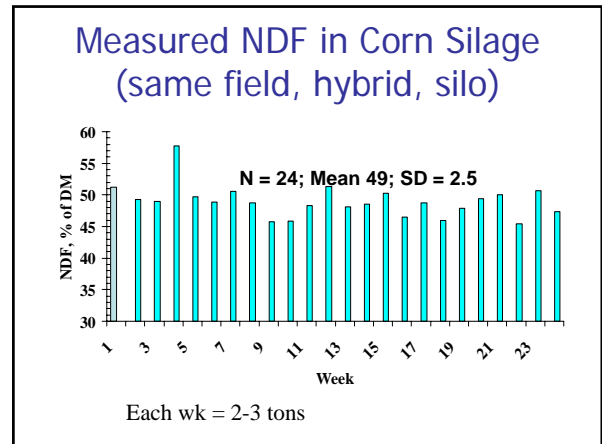
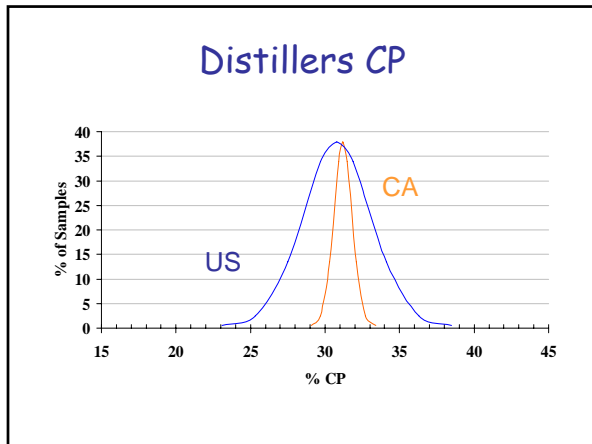
Normal Distribution

+/- 0.5 SD = 38% +/- 1 SD = 67%
+/- 1.3 SD = 80% +/- 1.6 SD = 90%
+/- 2 SD = 95%



Normal Distribution

\bar{x} - 0 SD = 50% risk of under goal
 \bar{x} - 0.5 SD = 30% risk of under goal
 \bar{x} - 1.0 SD = 16% risk of under goal
 \bar{x} - 1.5 SD = 7% risk of under goal
 \bar{x} - 2.0 SD = 2% risk of under goal



Variation

1. Greater variation = less certainty
2. Less certainty = increased risk
3. Increased risk = increased cost

'Laws' of Variation

1. Nutrient composition of all feeds vary
2. Variation between feeds is independent
3. Variation among nutrients within a feed are not necessarily independent
4. Variation increases with the square of the inclusion rate

Dealing With Variation

1. Collate data to get accurate mean and SD for your population
2. If composition changes for an unknown reason, use running mean rather than sample value

Dealing With Variation



- Limit inclusion rate of highly variable feeds
- Use a variety of nutrient sources
- Adjust mean for variation to reduce risk of error with greatest cost

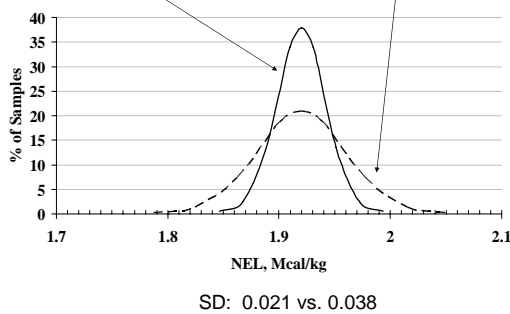
Ping Pong*



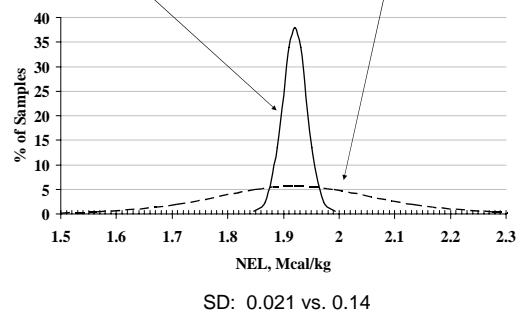
A program being developed by OSU that calculates expected variation in diets based on variation in feed composition

* Don't ask me how Normand came up with the name. It probably is some French-Canadian thing.

SBM vs. Single Source DDG NEL

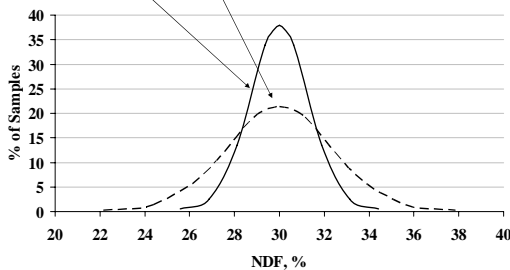


SBM vs. Generic DDG NEL



Good vs Bad Forage QC NDF

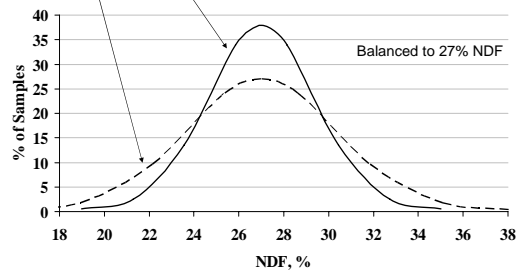
SD: 1.26 vs. 2.24



Both diets have 56% forage (50/50 alf silage/corn silage). The same mean concentrations were used for both diets

1 vs 2 sources of fNDF

SD: 3.2 vs 2.29



With 1 source, 27% of the time diet < 25%
With 2 sources, 20% of the time diet < 25%