

| <i>Sub #</i> | <i>Moisture Z-Values</i> | <i>Protein Z-Values</i> | <i>Ash Z-Values</i> | <i>Falling Number Z-Values</i> |
|--------------|------------------------------|-----------------------------|-------------------------|------------------------------------|
| 19 | * 3.54 | 1.40 | 0.24 | 1.17 |
| 38 | 0.82 | | | |
| 50 | 0.16 | 0.14 | 0.53 | 1.37 |
| 54 | 0.26 | 0.33 | 0.24 | 0.01 |
| 55 | 0.29 | 0.09 | 0.30 | 2.66 |
| 58 | 0.22 | 0.09 | 0.05 | 0.30 |
| 93 | 0.11 | 0.18 | 0.12 | 0.05 |
| 137 | 0.39 | 0.81 | 0.24 | 0.50 |
| 139 | 0.99 | 1.07 | 0.47 | 1.54 |
| 164 | 0.92 | 0.46 | 1.17 | 0.01 |
| 306 | 0.01 | | 0.24 | 0.19 |
| 308 | 0.52 | 0.88 | 0.23 | 0.04 |
| 387 | 0.99 | 0.70 | 0.87 | |
| 392 | 1.52 | 0.17 | 0.93 | 0.31 |
| 520 | 1.25 | | | |
| 592 | 0.52 | 0.17 | 0.34 | 0.28 |
| 623 | 2.13 | 0.98 | 3.02 | 0.22 |
| 657 | 0.47 | 1.23 | 0.76 | 0.48 |
| 660 | 0.49 | 0.25 | 0.23 | 0.93 |
| 687 | 0.14 | 0.17 | 0.94 | 0.16 |
| 771 | 1.52 | 1.49 | 0.75 | |
| 775 | 0.21 | 0.19 | | 1.63 |
| 902 | 0.69 | 0.17 | 1.11 | 0.80 |
| 1052 | 0.52 | * 4.56 | 0.82 | |
| 1326 | 0.01 | 0.67 | 0.65 | 0.04 |
| 1332 | 0.47 | 0.39 | 0.65 | 0.30 |
| 1352 | 1.02 | 2.82 | 0.64 | 0.52 |
| 1427 | 0.99 | 0.46 | 0.82 | 0.22 |
| 1456 | 2.45 | 1.38 | 0.40 | 0.29 |
| 1472 | 0.16 | 0.88 | 0.93 | 0.04 |
| 1493 | 0.72 | 0.60 | 0.82 | 0.91 |
| 1529 | 0.79 | 2.65 | 0.24 | 0.01 |
| 1534 | 1.50 | * 5.35 | * 3.73 | 1.42 |
| 1585 | 0.37 | 0.33 | 0.41 | 1.39 |
| 1662 | 0.42 | 0.42 | 0.76 | 0.06 |
| 1691 | 0.47 | 0.14 | 0.82 | |
| 1692 | 1.09 | 2.09 | 1.52 | 0.07 |
| 1694 | 0.24 | | 3.26 | |
| 1711 | 0.14 | 0.61 | 0.40 | |
| 1716 | 2.00 | 0.17 | 0.93 | 2.95 |
| 1729 | 2.53 | 1.02 | 0.93 | 1.42 |
| 1731 | 0.69 | 0.09 | 0.06 | 0.54 |
| 1732 | 0.49 | 0.88 | * 9.56 | 0.09 |

| <i>Sub #</i> | <i>Moisture Z-Values</i> | <i>Protein Z-Values</i> | <i>Ash Z-Values</i> | <i>Falling Number Z-Values</i> |
|--------------|------------------------------|-----------------------------|-------------------------|------------------------------------|
| N | 42 | 37 | 38 | 35 |
| Mean | 0.75 | 0.72 | 0.73 | 0.65 |
| Min | 0.01 | 0.09 | 0.05 | 0.01 |
| Max | 2.53 | 2.82 | 3.26 | 2.95 |

* Not included in analytical mean

Z-Values

Each individual z-value represents the decimal number of standard deviations by which an analytical result differs from the "true value", as represented by the mean. The minimum or "perfect" z-value is thus 0.00.

Proficiency in any one analysis over a year's time (11 or 12 monthly, 6 bimonthly, or 4 quarterly results) is determined by their mean z-value plus a penalty for each outlier (*) reported, if any. Proficiency in a series is determined by the mean of the mean z-values (including penalties, if any) for the specified principal analyses in that series.

In general, z-values of less than 2.00, consistently maintained and thus averaging less than 2000 over a year for a series (including outlier penalties, if any), are considered to represent satisfactory accuracy and precision. On the same basis, values of less than 1.00 consistently maintained represent outstanding accuracy and precision.

A detailed description of this rating system is available upon request from AACC headquarters.

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