BORREGAARD

PELHESION VS. 100% UF AND UF BLEND

PURPOSE

To compare the binding performance of Pelhesion versus 100% UF and a blend containing UF.

RESULT

Pellet durability averages with UF Blend, Pelhesion, and 100% UF were 90.4, 90.7, and 90.8, respectively. 100% UF is composed entirely of urea-formaldehyde condensation product (UFCP). UF Blend is UFCP combined with calcium sulfate (gypsum), which seemed to dilute its binding properties. Pelhesion is a combination of UFCP and calcium lignosulfonate (CaLS); this combination was similar to UFCP alone.

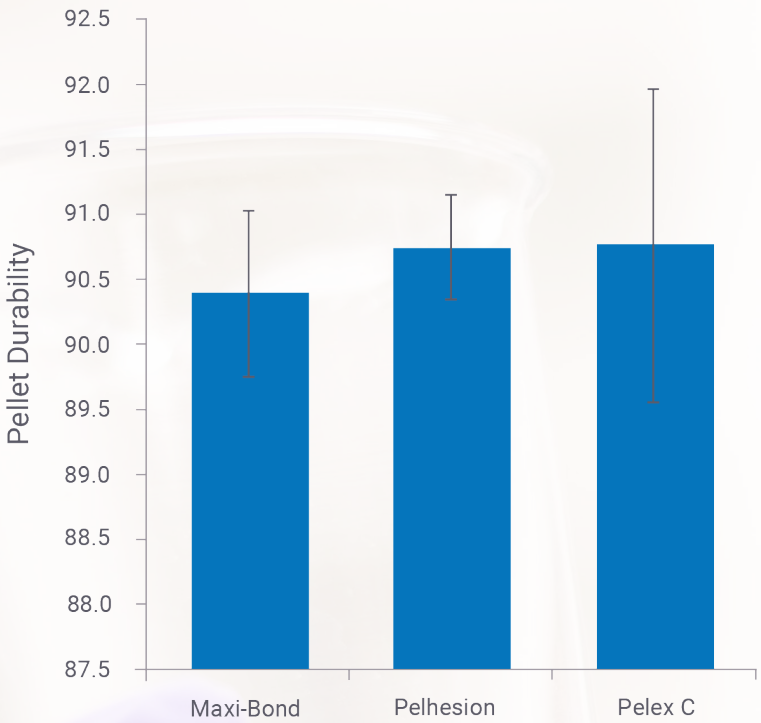

Figure 1 -Pellet durability with three binder treatments.

Borregaard

BORREGAARD

PROCEDURE

This test was performed in a grain concentrate pellet comprised primarily of fine ground corn and soybean meal. Three treatments were prepared with either Pelhesion, UF Blend, or 100% UF. All three binders were applied at the 0.25% level. Feed was conditioned with 40 psi steam to about 77°C and pelleted through a 5/32" by 1-¼" die (3.7 mm by 30 mm). Every attempt was made to keep the production rate and conditioning temperature constant. Pellet mill motor load (%) and conditioning temperatures were measured continuously by HOBO U12 data loggers (Figure 2).

The Pelhesion treatment was split into two equal parts and pelletized at the beginning and end of the trial, bracketing the UF Blend and 100% UF treatments. Samples were collected directly off the die at 4:00 minute intervals and returned to ambient temperature by evaporative cooling under a stream of forced air. Motor load and spout temperatures were captured at the time of sampling from the data logger. Pellet durability was determined by multiple runs on the New Holmen Portable Tester (70 mbar, 30 seconds).

BORREGAARD

DATA

Table 1 - Summary of results sorted by treatment.

		Motor load, %	Spout temp., °F	NHPT Durability
10:12	UF Blend	75.3	77.2	90.1
10:16	UF Blend	77.3	77.0	91.1
10:20	UF Blend	76.7	77.0	90.4
10:24	UF Blend	77.1	77.5	90.1
10:28	100% UF	80.5	76.9	91.3
10:32	100% UF	78.4	77.3	91.1
10:36	100% UF	77.9	77.4	91.2
10:40	100% UF	77.7	76.9	89.5
10:04	Pelhesion	77.7	76.6	90.5
10:08	Pelhesion	78.5	76.6	90.9
10:44	Pelhesion	76.0	76.2	90.4
10:48	Pelhesion	76.2	76.7	91.3
10:52	Pelhesion	77.1	76.7	90.7
Avg.:	UF Blend	76.6	77.1	90.4
Avg.:	100% UF	78.6	77.1	90.8
Avg.:	Pelhesion	77.1	76.6	90.7

BORREGAARD

DISCUSSION

UF Blend was included in this experiment as a negative control; it is known to be less effective as a binder due to its dilution by the addition of gypsum. Since 100% UF and Pelhesion were expected to be somewhat similar in performance, it was necessary to include a less effective product to measure the sensitivity of the test. The fact that pellet indeed lower with UF Blend shows that this test was effective at measuring differences in binder performance and that under these same circumstances Pelhesion and 100% UF had similar performance.

Conditioning temperature was captured from the data loggers during the time of sample collection. The vertical lines in Figure 2 show when sample collection was initiated. The collection period lasted for one minute. Thus the temperature recorded in Table 1 is the average temperature over that one minute period. It was just bad luck that caused every single sample collection with Pelhesion to be lower in temperature than every single sample collected with 100% UF. This difference was significant ((P < 0.05). Temperature is known to affect pellet durability. In a previous test with this same feed, one degree in temperature change changed pellet durability by 0.4 units. Thus, had the average temperature of Pelhesion been the same as 100% UF its durability would have been 91.1. Even so, the binding performance of these two products would still remain similar.

BORREGAARD

CONCLUSIONS AND RECOMMENDATIONS

Pelhesion, a combination of UFCP and CaLS, was similar in performance to 100% UF, which is comprised solely of UFCP.

THIS WORK WAS PERFORMED AND REPORTED BY BORREGAARD

Email: animalfeed@borregaard.com

www.borregaardfeed.com

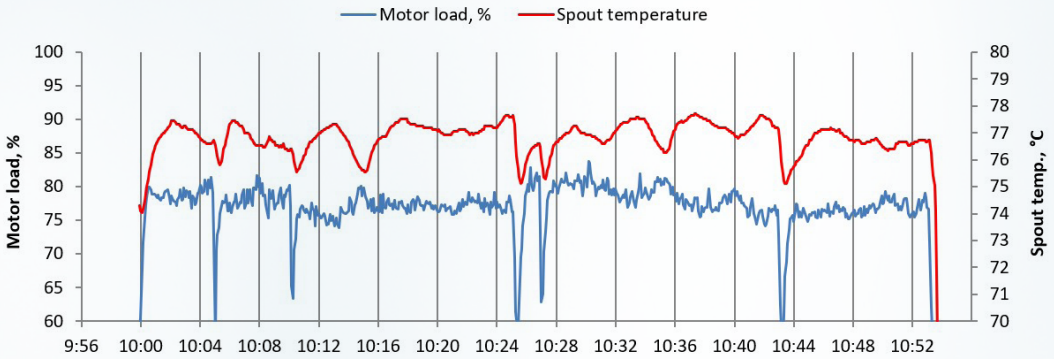

Figure 2 – Data logger record to pelleting conditions.

10:00 Begin with 0.25% Pelhesion.
10:05 Feeder stopped briefly to allow the die cavity to clear.
10:10 Switch to 0.25% UF Blend.
10:25 Switch to 0.25% 100% UF.
10:27 Feeder stopped briefly to allow the die cavity to clear.
10:43 Begin second portion of 0.25% Pelhesion treatment.
10:53 Run complete.

Borregaard