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PELLTECH IN SWINE FINISHER PELLETS

PURPOSE

To document improvement in the production rate of a Swine Finisher pellet achieved by addition of PellTech to the formulation.

RESULT

- Production rate of Finisher pellets increased from a maximum of 59 tons per hour (TPH) in Control to 70 TPH with addition of 0.5% PellTech, an increase of 11 TPH or +20%
- Pellet durability remained stable or improved with PellTech as production rate increased from 40 through 70 TPH (Figure 1).
- Power consumption was reduced with PellTech, from 6.8 to 5.6 kWh/Ton (-20%).

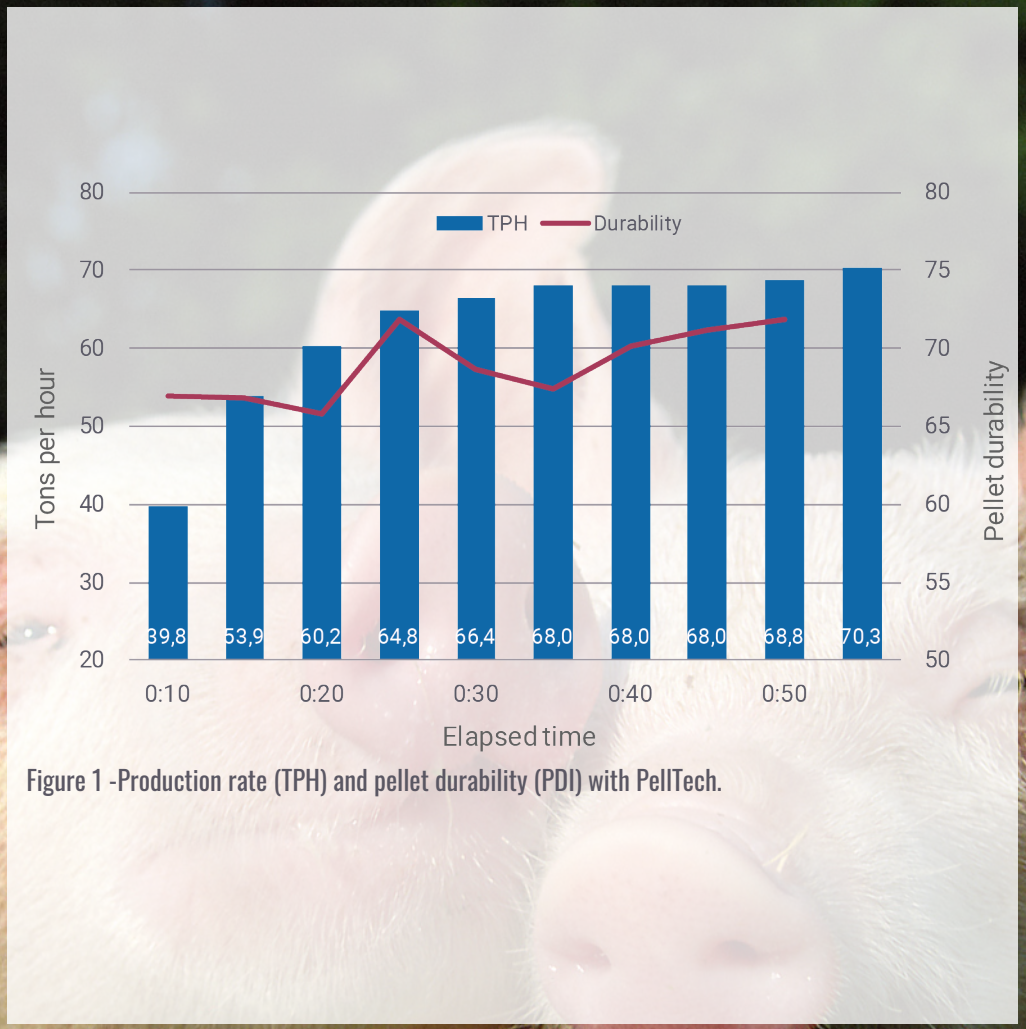

Figure 1 -Production rate (TPH) and pellet durability (PDI) with PellTech.

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PROCEDURE

The test feed was a corn/soya-based Swine Finisher. Fifty tons each of Control feed with no additive and feed mixed to include 0.5% PellTech were pelleted on a 500 HP CPM Press. Die Specs were 4.5 mm (11/64”) x 1-1/2” effective thickness (L:D = 9.2). Control set-points were: 90% motor load; 85°C spout temperature; and 60 TPH. Boiler pressure was 96 to 98 psi and regulated down to 29-30 psi at the pellet mill.

HOBO U12 Data Loggers were used to continuously record Amperage and Spout Temperature. In addition, Amperage, Spout Temperature and other process parameters were recorded manually in 5-minute intervals off the Beta Raven batching system.

Pellet samples were collected at 5-minute intervals at the transition from the pellet drag off the counterflow cooler to the pellet leg. Samples were collected by inserting a round PVC pipe into the stream of pellets flowing from the end of the counterflow cooler drag down a transition into the pellet elevator. Samples were stored in plastic bags.

Samples were screened over a #6 sieve. One-hundred grams of clean pellets were placed the New Holmen Portable Tester (NHP-100) and run for 30-second at 72 mbar without a filter. The weight of the surviving pellets was reported as the Pellet Durability Index (PDI).

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DATA

Table 1 - Summary of results sorted by treatment.

Time	Spout temp., °C	Amps	Feeder	TPH	Power, kWh/T	Durability
			Control Pellets:			
10:50	77.2	394	47	35.9	8.2	78.9
10:55	81.7	438	58	44.5	7.4	71.8
11:00	80.0	474	63	49.2	7.2	70.7
11:05	83.9	487	70	54.7	6.7	71.6
11:10	84.4	499	73	57.0	6.5	73.7
11:15	84.4	505	74	57.8	6.5	75.2
11:20	85.0	506	74	57.8	6.5	72.3
11:25	85.0	510	74	57.8	6.6	76.9
11:30	85.0	527	74	57.8	6.8	72.5
11:35	85.0	509	74	57.8	6.6	76.9
11:40	86.7	520	75	58.6	6.6	--
11:45	87.8	489	76	59.3	6.3	--
Average:	83.8	489	69	54.0	6.8	74.0
			Pellets with 0.5% PellTech			
15:20	81.1	372	51	39.8	7.0	66.9
15:25	82.8	429	69	53.9	5.9	66.8
15:30	86.1	447	77	60.2	5.5	65.8
15:35	87.2	475	83	64.8	5.5	71.8
15:40	87.2	480	85	66.4	5.4	68.7
15:45	87.2	503	87	68.0	5.5	67.4
15:50	87.8	499	87	68.0	5.5	70.1
15:55	88.9	493	87	68.0	5.4	71.2
16:00	88.9	490	88	68.8	5.3	71.9
16:05	89.4	496	90	70.3	5.3	--
Average:	86.7	468	80	62.8	5.6	69.0

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DISCUSSION

PellTech proved to be a highly effective processing aid. Figure 2 illustrates how the pellet press ramped up more quickly with PellTech, and to a higher production rate. This ultimately cut 10-minutes off the time needed to make 50-tons of pellets.

PellTech is a formulated product that includes a binder component. It is designed to allow increased production rate but has enough binding capacity to maintain pellet durability. This was demonstrated by the fact that, with PellTech, as production rate increased from 40 TPH to 69 TPH, pellet durability was maintained or increased (Figure 1).

Power consumption of the press was reduced by 20% with PellTech, from an average of 6.8 to 5.6 kWh/T. As production rate with PellTech increased, the power requirement remained relatively constant, decreasing from 5.9 to 5.3 kWh/T. Thus, the press was inputting a similar amount of energy into compressing the pellets through the die. This relatively constant pressure helped maintain pellet durability.

The significant drop in power requirement from 6.8 to 5.6 kWh/T upon addition of PellTech reduced the energy put into compressing the pellets through the die. Due to this reduction in compression, there was some reduction in pellet durability with PellTech versus Control. The dosage of PellTech that was used in this case was probably excessive.

It should be noted that production rate with PellTech was continuing to increase as the final tons of feed were consumed. PellTech allowed the press to exceed the 60 TPH set-point without exceeding 90% motor load. Again, PellTech was highly effective.

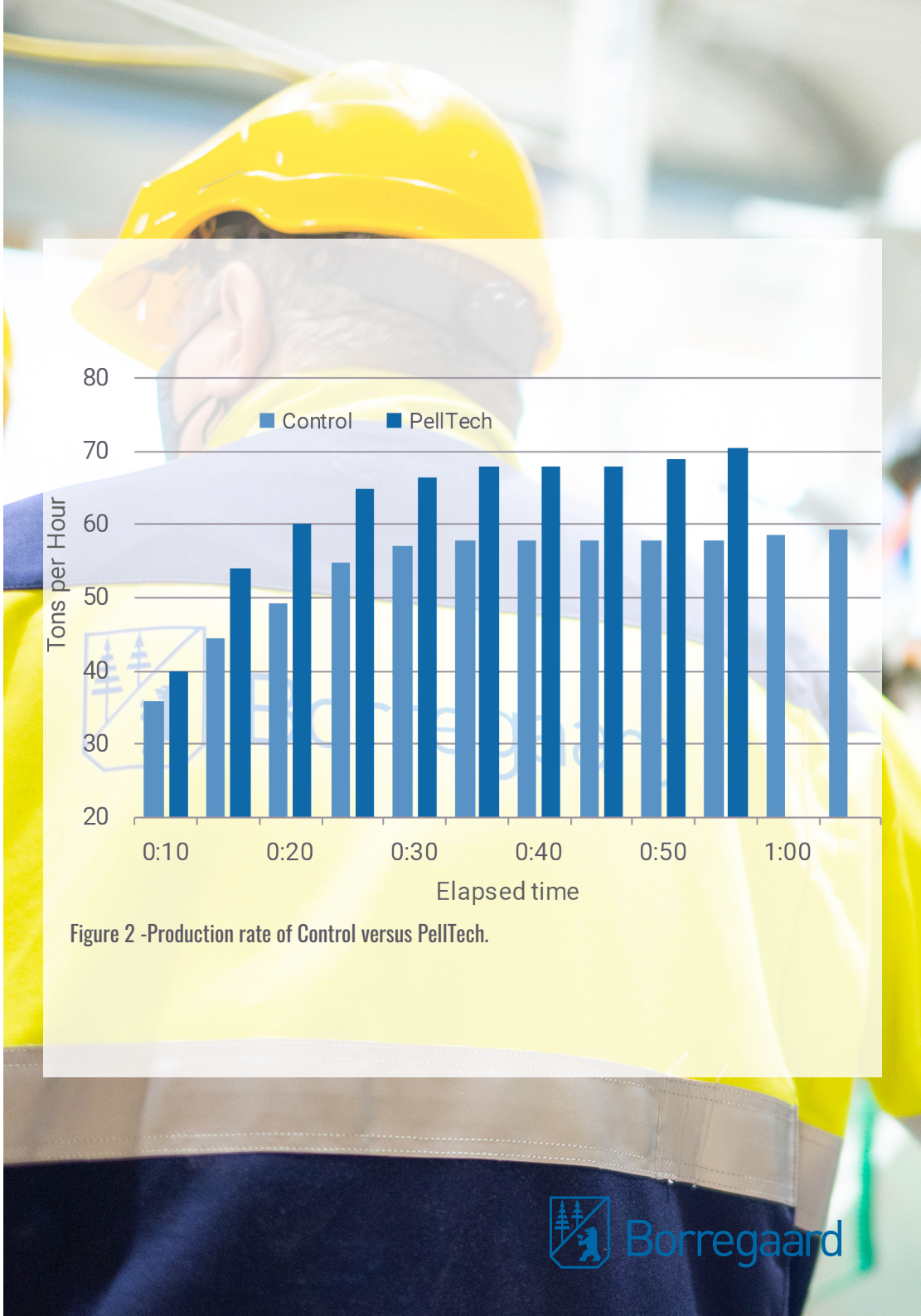

Figure 2 -Production rate of Control versus PellTech.

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CONCLUSIONS AND RECOMMENDATIONS

PellTech exceeded expectations in this demonstration. Production rate was able to reach 70 TPH without any signs of stopping. It is possible that this rate might over-reach the capacity of other systems in the mill, e.g., grinding or cooling. Lower dosages of PellTech should be tested to determine the most cost-effective level required to meet actual production demands.

THIS WORK WAS PERFORMED AND REPORTED BY BORREGAARD

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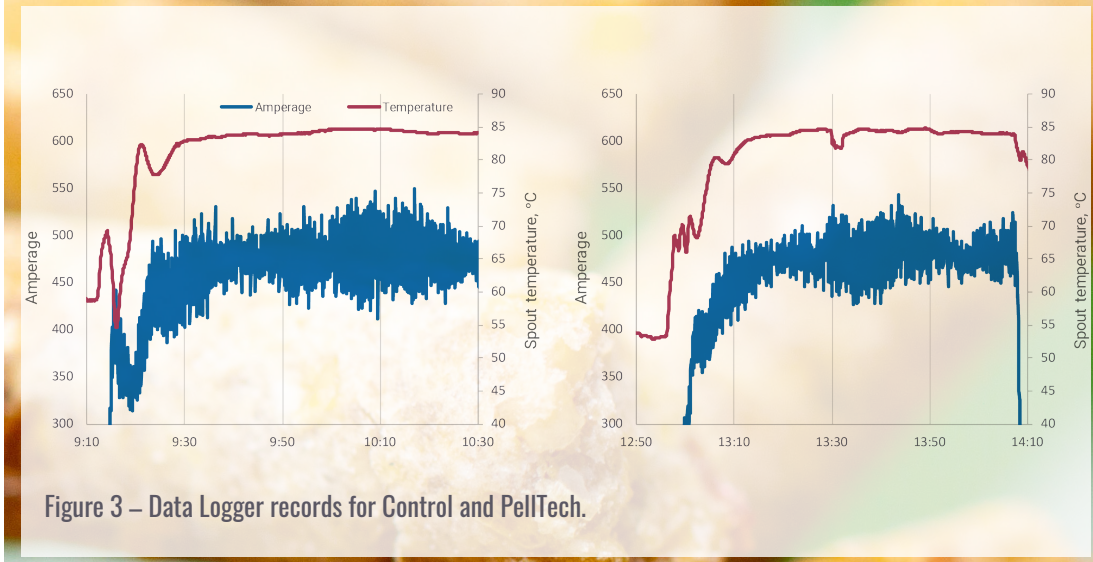

Figure 3 – Data Logger records for Control and PellTech.

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