



## **MILLSAVOR™ LIQUID CONCENTRATE IMPROVED POULTRY FEED PELLETING PERFORMANCE**

### **ABSTRACT**

The advantages of pelleting swine and poultry feed are well documented. However, the costs associated with making highly-digestible, durable and low-dust pellets vex feed mill operators worldwide. The purpose of this pelleting evaluation was to determine if MillsAVOR™ Liquid Concentrate would perform similar to or better than the market-leading pelleting aid in a large commercial broiler feed mill. In the final analysis, this evaluation determined MillsAVOR Liquid Concentrate was significantly better than the competitive product.

**KEYWORDS:** *Feed Milling, MillsAVOR, Pelleting, Throughput, Efficiency, Durability*

### **INTRODUCTION**

One of the biggest costs associated with manufacturing broiler feed is the cost of pelleting. The advantages of pelleting feed are well known in the feed industry, and the cost of pelleting is more than covered by the improvements in performance and efficiency. However, whenever feed mills can find ways to reduce the cost of pelleting, they quickly adopt this technology. Milling aids, steam quality and new pellet dies are all technologies employed to reduce the cost of pelleting. MillsAVOR Liquid Concentrate fits into the milling aids category.

This piece summarizes the evaluation of MillsAVOR Liquid Concentrate in a poultry feed mill in the United States. During this evaluation, the use of MillsAVOR Liquid Concentrate improved tons per hour, reduced amps per ton and reduced motor load when compared to a competitive milling aid. In addition to improving key milling performance measures, the use MillsAVOR Liquid Concentrate improved pellet durability index and did not negatively impact the accumulation of fine feed particles.

### **MATERIALS AND METHODS**

This evaluation was conducted in a large poultry feed mill with weekly pelleted production of more than 10,000 tons. This feed mill makes a variety of pelleted feeds including starter grower and finisher feeds. For this evaluation, the feed mill made mostly pelleted broiler grower feed.

Kemin Product Application Department (PAD) installed a temporary application system for applying MillsAVOR Liquid Concentrate during this evaluation. This system applied MillsAVOR Liquid Concentrate at the rate of 2 ounces per tons of feed (65.2 mL per metric ton of feed) along with 20 pounds of water per ton of feed (10 liters per metric ton of feed). Each batch of feed was 10 tons (9,072 kg), and batch cycle time was 10 minutes. This mill features two pellet lines, each with a capacity of 40 tons (36.3 metric tons) per hour. Maxi-Mil® I (Anitox Corp., Lawrenceville, GA) was applied using the current Maxi-Mil® application system. The MillsAVOR formulation was applied using the PAD temporary system.

On day one of this evaluation, the feed mill made only grower feed, and two treatments were used on the feed: 1) Maxi-Mil® I at 1 ounce per ton of feed (32.6 mL per metric ton) and 2) MillsAVOR Liquid Concentrate at a rate of 2 ounces per ton of feed (65.2 mL per metric ton of feed). Each treatment was applied to 100 tons (90.7 MT) before switching to the next product. The treated feed was held in individual bulk bins until the pellet mill was ready for the product, and the pellet mill ran out of feed before subsequent treated feed passed thru the pellet mill.

On day two of this evaluation, the feed mill again made only grower feed. On day two, there was also a “control” feed made to show the benefit of the treatment products. Treatments were applied to the feed at the following rates: 1) Maxi-Mil® I at 1 ounce per ton of feed (32.6 mL per metric ton) and 2) MillsAVOR Liquid Concentrate at a rate of 1 ounce per ton of feed (32.6 mL per metric ton of feed). Each treatment was applied to 100 tons (90.7 MT) before switching to the next product. The treated feed was stored in individual bulk bins, and the pellet mill ran out of feed before subsequent treated feed passed through the pellet mill.



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For the final day of this evaluation, the feed mill made only starter feed. Two treatments were applied to the starter feed at 1 ounce per ton of feed (32.6 mL per metric ton). Each treatment was applied to 100 tons (90.7 MT) before switching to the next product. The treated feed was stored in individual bulk bins, and the pellet mill ran out of feed before subsequent treated feed passed through the pellet mill. One problem which occurred on day three but did not happen on the other two days, was a condition called roll slip. This resulted in incomplete data for the actual tonnage and actual amps per ton.

During the pelleting evaluation, pellet samples were gathered after the cooler. Samples were taken at 10-15-minute intervals and were evaluated for fines and pellet durability index (PDI). One of the requirements for an effective pellet milling aid is to improve mill throughput in these products without increasing fines or reducing PDI. During this evaluation, samples of all pellets were evaluated for percentage of fines, and pellets were subjected to an aggressive PDI test. For the PDI test, a HOLMEN® NHP 100 tester was used to measure the durability of the pellets.

## RESULTS AND DISCUSSION

### Feed Mill Performance

The main parameters related to milling efficiency recorded during this evaluation were tons per hour, amperage and motor load. There are many other measures of pellet mill performance, however, the three measured were most significant to this customer. Table 1 summarizes each of these parameters from day one of this evaluation when pelleting broiler grower feed. For day one, the application rate was different for the two treatments with Maxi-Mil® I at 1 ounce per ton of feed (32.6 mL per metric ton) and MillSAVOR Liquid Concentrate at a rate of 2 ounces per ton of feed (65.2 mL per metric ton of feed).

**Table 1.** Summary of average mill performance data by treatment from first day of evaluation.

Treatment	Actual Ton/Hour	Amps	Actual Amps/Ton	Motor Load
Maxi-Mil® I	53.6	465	8.68	85.3
MillSAVOR Liquid Concentrate	57.7	445	7.73	81.6

During day one, the application of 2 ounces of MillSAVOR Liquid Concentrate per ton of feed demonstrated better performance when compared with 1 ounce of Maxi-Mil® I per ton. Output increased by more than 4 tons per hour, and amps per ton were reduced by just over 4%. As a result, motor load was much less when using MillSAVOR Liquid Concentrate.

Table 2 summarizes the data from the second day of the evaluation, again with a broiler grower feed. The data from day two are for each product applied at 1 ounce per ton (32.6 mL per metric ton). The control feed was not treated with either product.

**Table 2.** Summary of average mill performance data by treatment from second day of evaluation.

Treatment	Actual Ton/Hour	Amps	Actual Amps/Ton	Motor Load
Control	56.1	455	8.11	83.0
Maxi-Mil® I	55.6	451	8.13	82.7
MillSAVOR Liquid Concentrate	60.0	456	7.60	83.5

During day two, the application rates were the same, and a control feed was introduced. When MillSAVOR Liquid Concentrate was applied, output increased by nearly 4 tons per hour over the control feed and nearly 4.5 tons. Amps per ton were also reduced by just over 6% when MillSAVOR Liquid Concentrate was used when compared with either the control or Maxi-Mil®. Motor load was not different between treatments, and amperage was also the same for each treatment.

Table 3 summarizes the data from the second day of the evaluation, again with a broiler starter feed. The data from day three are for each product applied at 1 ounce per ton of feed.



**Table 3.** Summary of average mill performance data by treatment from third day of evaluation.

Treatment	Computer Ton/Hour	Amps	Computer Amps/Ton	Motor Load
Maxi-Mil® I	62.8	457	7.26	83.3
MillSAVOR Liquid Concentrate	62.7	450	7.17	82.4

During day three, the application rates were the same for each treatment. There was no difference in tons per hour, and amps per ton were very similar for each treatment. Both products improved pelleted performance at the same rate when pelleting broiler starter feeds.

### Pellet Durability Index and Feed Fines

Table 4 summarizes the data gathered related to fines sifted from the feed and pellet durability index (PDI) during all three days of the evaluation.

**Table 4.** Summary of average pellet characteristics by treatment by day.

Treatment	Fines			Pellet Durability Index (PDI)		
	Day 1	Day 2	Day 3	Day 1	Day 2	Day 3
Control	N/A	21.9%	N/A	N/A	70%	N/A
Maxi-Mil® I	8.9%	21.9%	34.5%	74%	79%	69%
MillSAVOR Liquid Concentrate	10.6%	23.0%	31.4%	73%	73%	68%

One of the big concerns when increasing pellet mill throughput is the fear pellet quality will suffer. Because tons per hour increase, there is a concern pellets will not retain enough heat or face enough pressure to adequately compress the pellet. In our evaluation, the use of MillSAVOR Liquid Concentrate improved pelleting throughput but did not negatively impact accumulation of fines or reduce PDI when compared with either Maxi-Mil® I or the control feed.

## CONCLUSIONS

In this evaluation, it was shown MillSAVOR Liquid Concentrate provided equal to or better improvements in pellet milling efficiency when compare to Maxi-Mil® I. Regardless of the feed type, grower or starter, the application of 2 ounces of MillSAVOR Liquid Concentrate outperformed Maxi-Mil® I. Even when used at 1 ounce per ton of feed, the amps per ton and tons per hour were improved with MillSAVOR Liquid Concentrate. Additional parameters measured were fines and PDI. The goal is not to impact these parameters during the improvement in performance. This evaluation showed MillSAVOR Liquid Concentrate did not have a negative impact on these measures.

## REFERENCES

Evaluation of Two Formulations of MillSAVOR™ Liquid Concentrate on pellet mill performance, TD-19-5192.

Maxi-Mil® I is a registered trademark of Anitox Corp., Lawrenceville, GA

HOLMEN® is a registered trademark of Tekpro Ltd, in England, Willow Park, North Walsham, Norfolk, NR28 0BD