

Lightning Trial Results



The following data was allowed by customers of Jacobs to be shared on a percentage basis only. Only represents a small portion of the Lightning Pellet Dies installed and successful in the world! 400+ Lightning dies in operation!

Poultry Feed:

1. Plant 1 -We achieved 10% less fines 40% more throughput (Wanted more tons) temp increased 14%
2. Plant 2- We achieved 20% less fines and 20% more throughput. (Plant wanted both quality and tonnage)
3. Plant 3- We achieved 25% less fines and 15% more throughput. (Quality concerned)
4. Plant 4- Achieved 10 points increase in PDI with no TPH decrease
5. Plant 5- Looking at annual run, First 6 months standard dies vs. last 6 months with Lightning System:
 - o 39% more TPH,
 - o 16% Higher Temp,
 - o Average of 22% less energy per ton.
6. Plant 6- Increased from 37 TPH to 50+ TPH. Energy savings over life of die \$13, 516.
7. Plant 7- Major producer target 10% DDG's, Increased PDI's at all plant 90%+, Average Energy savings \$15,000 CPM 7936

Wood Biomass:

1. Plant A- Ran 5% less fines, Die running 10% longer than normal at 5% increase in TPH
2. Plant B -Ran 25% more tons per hour, same hp. Die life about the same in hrs, but tons more.
3. Plant C -Ran 25% less energy kept tons per hour same. \$50,000 energy savings per mill.
4. Plant D -Fines decreased 5% points, throughput increased 31%.
5. Plant E- Achieved 18% increase in tonnage per hour and <1% fines.
6. Plant F- Increased TPH by 1 TPH energy savings over life or die \$5,416 per mill. LM 26-4, Hardwood
7. Plant G- Increased TPH by 26% energy savings over life or die \$15,450 per mill. Bliss 200A, Hardwood

General line feed: (Customers allowed actual numbers)

1. Plant A: Reached 95 PDI (average 89-90) a higher TPH rate of 9.4 TPH, normal was in the 8 TPH
2. Plant B: On a bad horse feed able to reach 90PDI at 15 TPH; 6 TPH higher in output with a 2 point gain in PDI
3. Plant C: Normally run at 7.5 to 8 TPH with a 93 to 95 PDI range. Lightning at 10 TPH with 96.9 PDI.
4. Plant D: Normal is 6 TPH; Lightning at 12.3 TPH; 10 degrees hotter with same PDI.
5. Plant E: 3020-6 Mill 8 TPH 15 TPH+ with 5 point PDI increase
6. Plant F: All Mills on Lightning went from 24x7 day run to running only 5 days.

High Rock & Hard Running Formulas

1. Ease of Operation- Employees used to have to punch out die bi-weekly. We have ran it 9 months no die change!
2. Ease of Operation- Mill used to be 60% efficient due to high Amp spikes; we have reached 82% this month with Lightning!
3. Quality- PDI's improved to 98; and fines have disappeared. Our end customer asked if we changed something, because for the first time ever the end of the feed line is getting pellets!

Corn Gluten Pelleting

1. Throughput: Doubled output amps same
2. Quality Run: Bulk density increased 12% at 4% less amps.
3. 20% More Throughput at 90+ PDI's
4. Mill reduced Pellet mill usage from 6 Machines to 4. Savings \$1 Million Annually

Hog Swine Pelleting Feed

1. Achieved 13% less fines 15% more throughput (Wanted more tons) temp increased 9%
2. 30% improvement in TPH
3. Mill Capacity increased 47%, allowing production to cut 24 hours from necessary operation.
4. Quality Die was designed, PDI's from low 60's to low 80's, plus we gained 10 TPH.
5. 15% improvement in quality and Tonnage. Reduction in slips and ZERO time to full capacity made up additional 1000 tons per week in addition to the 15% TPH.

Chicken Manure

1. Doubled output at same quality and same energy.
2. Fines decreased from 15% to 2%, maxed out feeder with amps 50% of normal load.

DDG's in feed

1. Producer was able to double DDG inclusion and maintain quality with Lightning Die.
2. Producer in all swine and poultry formulations was able to increase DDG inclusion 27%.

Soy Pods and Hulls

1. Quality increased 10 pts on PDI; fines cut in half. Energy savings of 18%!
2. Tonnage increase 62% with no increase in fines or decrease in PDI!
3. PDI increase of 22 points, 82% reduction in customer complaints. 81% Increased customer positive feedback.

Sugar Beet Pelleting

1. Fines decreased to under 1%, with increase of 37% TPH
2. Energy per ton consumed dropped 33%.

Swine Feeds

1. Hard running feeds normal is 12-14 TPH, with Lightning 18 TPH. 30% Improvement.
2. 500 HP mill, increased tonnage additional 15 TPH, Allowed 10% increase in temperature. PDI's increased 10%
3. 400 HP mill, increased tonnage additional 12 TPH, Allowed 13% increase in temperature, PDI's Increased 18%