

Air Classification = Low Ash, High Protein Products

Rendered animal meals provide a great source of protein for livestock but often contain levels of ash that are too high to be used in pet food for domestic animals (i.e., dogs and cats). This forces producers to rely on the quality of raw materials to determine when pet food-grade meals can be made. When there is a shortage of low-ash raw materials, producers simply cannot make high-value pet food-grade products.



with the machine. Once the best selector blade setting is determined, operators can simply dial in a speed adjustment using a variable speed drive to fine-tune the desired product specifications or to compensate for any unexpected changes in the composition of the raw materials (i.e., ash, protein, fat, moisture). In all cases, there is a controllable relationship between protein/ash levels and output yields of the fines fraction (lower ash/higher protein) and the coarse fraction (regular ash/regular protein).

The challenge is to convert livestock-grade protein meals into meals favored by pet food manufacturers without any waste. In other words, create two products from one.

Extending the Rendering Process

Rendered animal protein meals are produced through a series of steps that include pressing, cooking, defatting, milling, and screening. This process creates animal protein meals that are sold for livestock. Specialized air classification technology separates the finer powder meal from the coarse meal. The resulting air classified fines fraction contain higher protein/lower ash that can then be sold at a premium value for pet food or for aquaculture feed. At the same time, the air classified coarse fraction could still be sold as a regular protein/ash feed meal product for livestock animals.

Air classification has been proven to reduce the ash content and increase the protein in every species of animal meals tested. Table 1 shows examples of the air classifier's performance with various animal protein meals. Typical results include reduction of ash content as low as five to seven percent and an increase of protein levels by three to five percent, which is suitable for the ultra-premium pet food grade market.

Capacity versus Energy

The Whirlwind Air Classifier has only one motor that controls the entire machine. The motor rotates a feed distribution plate that scatters the meal into an open area. The same motor rotates an internal fan creating updraft airflow that accelerates finer/lighter protein particles, separating them from coarser/heavier ash particles.

The same motor also rotates a series of selector blades that reject some of the undesirable near-size ash particles. By using only one motor, the energy consumption is very low (approximately three to five horsepower per tons per hour of feed capacity).

The Whirlwind Air Classifier features an internal fan and air recycle design that does not require auxiliary equipment (i.e., baghouses, cyclones, or ductwork) to capture the lower ash and higher protein fine product. The fluidized meal is also resistant to major clogging because the machine has minimal dead zones where high fat and sticky material can settle. This makes the air classifier both low maintenance and reliable for continuous use.

Table 1. Performance of air classifier on various animal protein meals

Meal type	Ash content/ reduction	Protein content/ increase	Ultimate results
Poultry and chicken meal	17% down to 10-12%	67% up to 70-75%	5-7% ash reduction, 3-5% protein increase
Lamb meat and bone meal	27% down to 14-21%	56% up to 60%	6-13% ash reduction, 4-5% protein increase
Porcine/Pork meat and bone meal	27% down to 17-21%	53% up to 57-61%	6-10% ash reduction, 4-8% protein increase
Fish meal	21% down to 14-18%	62% up to 64-68%	3-7% ash reduction, 2-6% protein increase
Bovine/Beef meat and bone meal	33% down to 25-29%	50% up to 52-59%	4-8% ash reduction, 2-9% protein increase
Duck meal	24% down to 11-17%	58% up to 64-69%	7-13% ash reduction, 6-11% protein increase

Controlling Quality

Sturtevant's Whirlwind Air Classifier uses an internal fan to fluidize the protein meal and mechanical selector blades to separate the animal feed meal into a fines and a coarse fraction. This process is much more selective and versatile than cyclones or screens as the air classifier does not clog like fine screens do. By changing the quantity of selector blades, a wide range of low-ash, high-protein products can be made

Summary

Air classification technology produces a high-value, low-ash pet food-grade product from lower-quality feed meals. At the same time, the coarse fraction still contains enough protein that it can be sold as a regular livestock-grade feed product. **R**

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Perfection is Doubling Your Profit



Perfecting Particle Size

The Sturtevant Whirlwind® Air Classifier creates high protein / low ash product from rendered meal to meet the demand for high digestibility.

- Control ash in rendered meal to create more profitable products
- Easy maintenance with no screens to clean
- Designed specifically to meet the challenges of the rendering process



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