



Feed industry professionals, academics and business people learned about inner workings of a feed mill at the Build my FeedMill Conference on March 13 at VIV Asia.

In conjunction with Milling and Grain, VIV Asia hosted 12 speakers who presented information about their feed mill and storage products. Those in attendance were led through the entire milling process, from intake and conveying to weighing, grinding, pelleting, drying and cooling and storage.

## #5 Crushing roller mill



by Maren Weßels, Amandus Kahl, Germany

**H**igh-quality ingredients and an optimal formula are the most important factors in animal feeding. The importance of the feed structure, however, often goes unmentioned, although recent findings of the feed industry have shown that it is an at least equally important factor for successful feeding and fattening.

For this reason, the machine and plant manufacturer Amandus Kahl has focused its research efforts on this field: For decades, the German company has manufactured the so-called crushing roller mill which ensures the ideal adaptation of the feed structure

to the needs of the respective animal species.

As the name suggests, a crushing roller mill consists of two rollers that crush the product. In addition to different types of grain, also legumes, oilseeds and feed mixtures can be processed. Unlike in the hammer mill which crushes the grain with maximum force, specific crushing takes place in this machine.

Thus, the obtained final product is not mealy or powdery, but a crushed and coarse-grained feed. Furthermore, the crushing roller mill produces a uniform grain size due to the individually adjustable gap. Owing to its structure, the crushed feed is particularly suited for use in pig, cattle or poultry farming.

The concept of crushing using the crushing roller mill includes even more technical features: Apart from the counterrotation of the two rollers, there is a differential speed of the roller pair. The



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Two-hour event

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**Part of VICTAM and Animal Health  
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crushing is achieved by a combination of shear stress, cutting and pressure.

A special corrugation of the rollers contributes to the crushing of the product. The roller diameter influences the product feeding and the size of the grinding zone. Multi-stage grinding with upstream screening ensures an optimized particle size distribution.

Which are the specific advantages of crushing for the feed industry? With regard to nutritional physiology and cattle feeding, the advantage of this crushing method lies in the fact that less starch degradation takes place in the rumen.

As ruminants, cattle generally require a coarser and more fibrous feed structure. The grains must only be halved or quartered using the crushing roller mill - further crushing of the husks is not required.

In pigs, mash feed may even cause diseases of the oesophagus and the stomach. Feeding of pellets is not an option, either, as pellets are too hard. For this reason, expanded feed produced with the Kahl annular gap expander ensures the best results in feeding.

Coarsely crushed wheat in the mixture produces less pathological changes in the gastric system, less diarrhoea, a lower mortality rate, and healthier pigs in general. A reduction of stomach ulcers is obtained in fattening, as the more solid consistency and coarser structure ensure a reduction of the pH value in the stomach.

Also poultry requires a coarse feed structure since the animals have a muscular stomach. This species is also known for its selective feed intake. Such feed selection is avoided by a uniform feed structure as produced with the crushing roller mill due to the individually adjustable gap. At the same time, feed losses due to the meal content which is not eaten are reduced.

The following raw materials and mixtures are excellently suited for processing on the crushing roller mill: wheat, oats, peas, maize, rape, structured feed for layers, barley, bean, lupins, soybeans, feed mixtures.





Moreover, the low meal content produced during crushing of the respective product makes the Kahl crushing roller mill an economical solution for conditioning feed made from the above-mentioned raw materials for the animal feed industry.

In order to meet individual requirements, the crushing roller mill is available in a single-stage, two-stage or three-stage design. The capacity ranges from 10-to-60 t/h with a drive power of 22-t- 55 kW (motor with V-belt drive and gear). At a length of 1000mm the roller diameter is 300mm. If a length of 1500mm is desired, a diameter of 300-or-400 mm can be chosen.

All rollers are made of special steel, chilled cast iron. The modular design of the crushing roller mill ensures an easy capacity increase. Another major advantage is the fast and easy roller change.

Amandus Kahl is currently working on a technical modification of the drive. While the rollers are currently driven by a V-belt, the future of the crushing roller mill is a direct drive. As a result, there will be a separate drive for each roller (and not for each roller pair) so that the rollers can be driven at different speeds. This technical innovation is intended to ensure an even more uniform and faster crumbling of the product.

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