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GOING CHEMICALLY & MICROBIOLOGICALLY INTO FOOD SAFETY p68

THE RIGHT SLICING TECHNOLOGY IMPROVES PRODUCTS & PROFITABILITY

FOOD MANUFACTURERS ARE ALWAYS LOOKING TO INCREASE PRODUCTIVITY WHILE MINIMISING COSTS. FOR FOOD PROCESSORS, THIS CAN BE ACHIEVED WITH THE RIGHT EQUIPMENT FOR THEIR OPERATIONS. BY **DEBRA NOVELLO**, SPOKESPERSON, URSCHEL USA

FOOD manufacturers globally face many challenges when purchasing capital equipment. A wise investment in the right type of slicing/reduction equipment can payoff in terms of greater overall efficiencies throughout the entire line and less downtime resulting in cost-savings and fewer headaches.

Choosing the correct piece of cutting machinery may be challenging, but worth the proper time and effort to eliminate future pitfalls.

IDENTIFY POTENTIAL GROWTH

Review the current cutting area of the manufacturing line, and identify objectives accordingly. What greater efficiencies could a new dicer/slicer add?

Many processors state the need to increase overall yield and then add other components down the processing line to increase volume overall, or add multiple lines. Other processors feel additional types of cuts with less waste could make their lines more ideal—perhaps capitalising on a higher yield of a smaller cut. Others would like to decrease waste by producing a greater percentage of cuts within their ideal target range. Still, others seek novelty cuts alongside their R&D to grow their consumer product lines.

ESTABLISH INGREDIENT CHARACTERISTICS

After determining potential goals and avenues for growth, take a close look at the product/ingredient that is processed. Identifying characteristics of the application is important to realising the best-suited form of reduction.

Delivery of the product to be reduced is often dependent on these characteristics. Some ingredients are easily batch-processed through gravity feeding, while others need to maintain structural features and are more easily belt-fed into the cutting area where timing of cuts corresponds to the belt speed.

Consider density, structural fragility, temperature, flowability, and fat content among other potential aspects—multiple other identifiers may exist such as degree of stickiness in sugary products.

SEEK A TEST CUT OF THE APPLICATION

Before the purchase, seek a test cut of the application. Delivering the ingredient to be processed, or a similar item readily store-bought may assist in evaluation of cut quality, benchmark potential yields, or allow a comparison of different slicers side-by-side.

Many processors choose to witness test cutting in person to ask questions related to the trials. If time does not permit, look into asking the slicing manufacturer to videotape the trials. Also, test cutting reports should be supplied by the manufacturer for further evaluation.

EVALUATE NOT ONLY THE SLICER

There are many benefits of choosing the right slicer/mincer for the right application, but also evaluate the company and support behind the machine.

Explore the manufacturing process behind the machine. Quality craftsmanship and precision go hand-in-hand with hygienically designed materials, ease of maintenance, and cleanability. Look into associated materials such as machine operating manuals to get a better idea of the technical aspect. Ask about the technical support department hours and experience, and method of dispatching technical service personnel to a plant.

In addition, determine commonly replaced parts on the slicer, and policy on availability. Measure these costs and benefits and put this together with the initial cost of the potential slicer.

Certain cutting applications are simpler and more routine than others. The more complex cutting applications require greater care and attention to detail. Honing in on which machine best benefits an application is one step. From here, the focus should be on the ideal machine set-up in terms of feeding features and specific options within the cutting chamber such as knife choices, spindle set-up, potential use of heavy-duty parts where necessary, and discharge options most beneficial to the processing of the product.

Be aware of the wide range of component options that would deliver the best outcome based on the product. Depending on the processing line, specialised changes may be advantageous. While the cutting trials may have exceeded expectations, perhaps a slightly different discharge height or input height would be more ideal. In this case, some slicing manufacturers have the know-how and offer greater assistance in delivering these options through a certified print process.

This process has the potential to become costly, so these decisions should be evaluated carefully. On the flipside, the certified print process could deliver the ideal solution to fit seamlessly into the production line.

DIFFERENT TYPES OF SLICERS/MINCERS

Whilst there are many various types of commercial slicers/mincers on the market today, this article will focus on three popular options. All three have the ability to run continuously to keep downtime to a minimum, and production running optimally. They also offer flexibility in terms of a full complement of precision cut styles, sizes, and high yield outputs.

CENTRIFUGAL, MULTI-STATION SLICER/MINCER

Product enters the rotating impeller (Fig.1 [1]) and is held against the inner surface of the cutting head assembly by centrifugal force. The cutting head assembly consists of eight fixed, individual cutting stations. Slices or shreds are produced as product passes each knife (Fig.1 [2]) in a smooth, uninterrupted manner. Length is dictated by input product size. The infeed hopper typically accepts products up to a particular length, so pre-cutting of some products may be necessary.

Wide variety of slice profiles is available depending on different cutting head configurations. Popular applications for this type of slicer include potato slicing for crisps/chips.

In most cases, slicers are equipped to process at a much higher volume than the fryers in the line, so slicing capacity, depending on the fryer set-up, may range from 1,100 to 2,300 kg per hour of 1.6 mm flat potato slices. In addition to slicing, options include granulations of ingredients such as nuts and cheese.

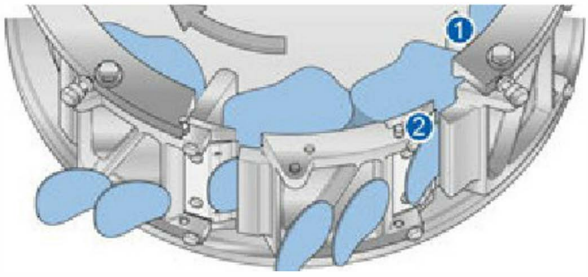

Fig.1: A centrifugal, multi-station slicer/mincer

BELT-FED, WHEEL SLICER

Product is delivered onto two high-speed feed belts (Fig.2 [1]) sloping together to form a 'V'-shaped feed trough. The belts are synchronised with the rotating slicing wheel (Fig.2 [2]) to ensure proper advance of product per revolution of the wheel.

Knives (Fig.2 [3]) under tension serve as spokes and support the rim of the slicing wheel. The knives are slightly twisted to create a uniform pitch from the hub to the rim. Knife pitch serves to pull product through the slicing wheel and produce a precise slice thickness.

One slice is made at a time preventing any crushing of the product. The cut slices are then released into a sloped discharge chute to reduce their speed before exiting the machine. This type of slicer accepts firm and leafy (or more compressible) products up to certain diameters, and is ideal for elongated products that benefit from proper orientation—which can reduce overall waste.

With proper feeding and orientation, a customer running 4.8 mm flat slices of carrots can achieve a capacity ranging from 4,500 to 5,500 kg per hour; a customer running 4.8 mm flat slices of cucumbers can achieve an expected capacity of between 3,600 to 4,500 kg per hour.

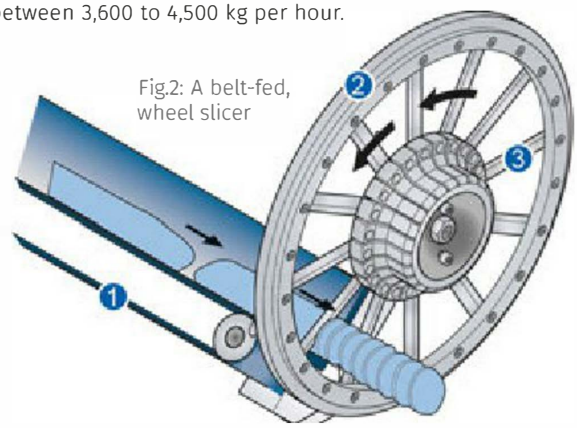

Fig.2: A belt-fed, wheel slicer

IT IS WORTH THE TIME AND EFFORT TO CHOOSE A MACHINE TO ELIMINATE FUTURE PITFALLS.

VERSATILE COMMINUTION MINCER/SLICER

Product is guided to the high-speed, rotating impeller (Fig.3 [1]). When a product reaches the impeller (Fig.3 [2]), it revolves at a high speed inside the cutting head (Fig.3 [3]). Centrifugal force propels the product outward past the cutting edges of the stationary reduction head.

Small portions of product projecting into the spaces between the separators are cut off into flakes by spaced columns of vertical knives. These flakes fly outward and away from the cutting head. The wall surfaces between the vertical knives are relieved to eliminate rubbing friction that would produce heat.

Three types of reduction heads enable a broad spectrum of capabilities. This type of machine would be ideal for free-flowing dry and semi-dry products including peanut butter, pastes, and sauces. The word 'Comminution' means to gradually reduce to a smaller size. This creates a reduction in particle sizes, and coarse to fine emulsions are possible.

Popular reduction applications include nut butters and nut milks. Various consistencies are available. For ultimately smooth almond butter for example, an almond paste may be reduced using a two-step process involving two machines, each equipped with a slightly different microcut head to deliver targeted results within customer specified parameters.

Almond processing is very dependent on the characteristics of the almonds. Optimum expected capacity on almond butter is estimated at 680 kg to 910 kg per hour.

Almond milk is also made through a two-step process involving two machines: one equipped with a cutting head to pre-cut the product to a smaller particle size, the other equipped with a microcut head processing combined product and water to further refine the particle size to the required consistency.

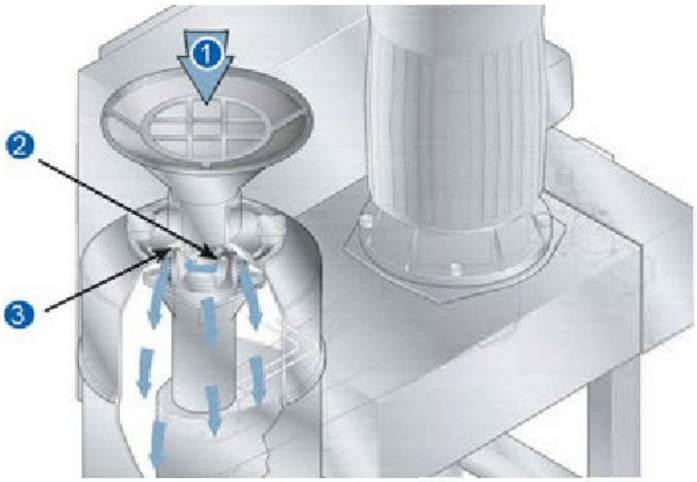

Fig.3: A versatile comminution mincer/slicer

EMERGING TRENDS—MAKING WAVES IN VEGETABLES

As consumers continue to seek healthier choices, fresh and frozen vegetable processors continue to explore ways to capture this growing trend. A number of different styles of cuts are either currently new to the market, or on the radar of R&D.

Manufacturers can invest in a unique look to entice increased purchases versus competition, while limiting waste to maximise profits. With rice for example, small dices limit waste, and offer the texture of rice in a low-calorie option as compared to white rice.

To capture consumer attention, squash could be transformed into long, noodle-like cuts. Beets and carrots could also be featured in a novelty bow-tie cut, instead of appearing as they normal selves in conventional straight cuts.

FEATURES IN SLICERS—GOING BIG AND CAPTURING PROFITS

When ordering a new piece of cutting machinery, processors of large-scale items (e.g. cabbage processors) are asking to limit pre-cutting and handling of the product. Other processors such as stuffing manufacturers are also interested in going with bigger infeed options for whole loaves of bread. These options are available, and should be examined.

Another option growing in popularity and profitability is capturing excess juice as fruits/vegetables are being cut. Juice collection trays and other options are available to assist in this operation. APFI