Advances in Cutting Technology, Blade Design

The mechanised process of chopping fresh vegetables dates back around 25 years. Before that time most products were sold straight from the field or via shops and supermarkets. The chopping and preparation was done at home or in HRI (hotel, restaurant, institute) kitchens by the kitchen staff. Gradually some small, family-owned companies started to prepare (i.e. wash and cut) the vegetables for the HRIs, including restaurants such as McDonalds and Burger King.

Only when supermarkets began putting these products on their shelves – countries such as the UK started with salads and sandwiches, and France with the quatrième gamme – did salad processing begin to emerge as an industry. Companies processing fresh vegetables started to grow rapidly as it was discovered that even sensitive produce such as onions, peppers and salad leaves could be chopped mechanically using high-speed cutting machines, removing the need for intensive manual labour. Convenience food products were introduced and today various companies are producing freshly prepared vegetables and ready meals with as many as 1,200 employees and 300 to 500 hundred products.

Cutting technology

The mechanical cutting of vegetables was not a new process, but there had never previously been the demand or the market for freshly cut vegetables. One-, two- and three-dimensional slicers and dicers had already been available for over 50 years and were widely used in the canned and frozen vegetable industry. The invention of the centrifugal cutting principle by Urschel®, which made it possible to make clean, quick incisions in three dimensions, revolutionised continuous food processing.

Previously, most machines worked using grids, which 'squeezed' the produce rather than cutting it. However, there were still no machines that could prepare salad leaves. Companies such as Kronen and Eillert saw success here with the introduction of the flat-belt slicers: machines with a flat belt and sickle-shaped blades that could slice even fibrous food. The disadvantage of these machines was the low capacity for smaller cuts.

Since the freshly prepared vegetable market was growing fast, Urschel decided to develop the larger, high-capacity TranSlicer2500® (now available as latest model TranSlicer2510) – a V-belt slicer that works using high-speed cutting technology and that can handle whole iceberg lettuces.

Why high-speed cutting? Because one thin blade passing very quickly through any vegetable product makes a clean cut. When 24 of these blades are mounted onto a slicing wheel under tension, which then rotates at 2,000 rpm, the machine will produce 48,000 perfectly clean slices every minute.

Blade design, scalloped blade

Thin blades worked very well on products like cucumbers, carrots and iceberg lettuce, but some fibrous products like rhubarb, leeks and green beans would benefit from the slicing
action of a sickle-shaped blade, provided – of course – it could be combined with high-speed cutting. This is where the scalloped blade was created.

The sharp points on the blade penetrate the fibrous product and the sides create a slicing action, which cuts through the fibres. Although the blade needed to be a little thicker, this did not seem to affect the quality of the cut. In fact, the quality improved even further. More and more successful applications were found for these types of blades, including slicing tomatoes and even fresh lean beef.

Another advantage of these scalloped blades is that they stay sharp for longer. This means less downtime to change wheels and blades, and therefore a longer continuous production time using the same blades.
Special blades for special products

The scalloped blades are one example of special blades being made for particular products and particular cuts. There are already more than 25 different blades available for the TranSlicer 2510: thin, narrow, wide, thick, thick heavy duty, special bevel, crinkle, crinkle heavy duty, julienne blades with different tab sizes and spacing, and now the scalloped blade in standard and heavy-duty variants. There are also many different blades available for the three-dimensional dicers, including circular and cross-cut blades.

Sharp!

Only sharp blades perform well. All cutting-machine suppliers will also offer sharpeners or honing machines to sharpen the blades, because we know the importance of sharp blades. Processors using the blades should be aware that it is better to sharpen the blades regularly, rather than allow them to become blunt. Sharp blades increase the shelf life of the products, reduce the machine maintenance time and reduce the amount of fibres and juices entering the waste water system. Ultimately, regular sharpening saves money!

It is also important to have the correct cutting bevel. Blades should therefore always be sharpened using the correct, preferably the original, honing machines and honing wheels. Alternatively, use Urschel’s sharpening service by sending the blades to your local Urschel office.

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