Solving the puzzle for quality formed meat products

Creating perfectly formed meat products is just like a jigsaw puzzle as every part of the process must be perfectly aligned and in place in order to complete the picture successfully, however there are creative ways of overcoming the technical challenges that can occur to ensure the highest possible quality products, whilst continually innovating to meet consumer demand.

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Creating perfectly formed food products is a very precise technical process. Whether supplying burgers and chicken nuggets or fish and vegetarian options, leading supplier of food processing equipment GEA recommends two primary production methods for the precise forming of these products, with the aim of demystifying this multi-faceted operation and highlighting the support that is available for manufacturers.

These are plate forming for low to medium production levels and rotary forming for the high speed manufacture of long run standard products.

However, regardless of the forming technology used, it is often the upstream process of preparing the raw mix that has the biggest impact upon the success of operations further down the line to provide the consumer with wholesome, tasty and exciting food. The mixture must be carefully prepared with the right balance of ingredients at the right temperature and viscosity, to feed efficiently into the forming equipment.

Manufacturers sometimes make the mistake of trying to mix all the ingredients together in one go. However, some ingredients, such as starches, are only effective during cooking and can inhibit the absorption of water if added too early.

Perfectly formed meat replacement product.

Best possible yields

To ensure the best possible yields, the required level of moisture must be retained within formed products. Water also acts as a carrier for salts and other additives which extend shelf life and enhance flavour, texture, colour and binding properties. Binding water into chicken mass is often the one aspect of forming that can prove the most difficult.

To overcome this, technology has been developed that mixes the ingredients in near vacuum conditions which helps to open up the meat cells thereby improving the water retention of chicken.

Vegetarian products and fish have much less natural ability to retain moisture and so always require the use of additives and moisture-retaining ingredients to create the required consistency for forming.

The choice of forming equipment, plate or rotary, depends largely on the application, the volume and on what the customer is trying to achieve. Rotary forming is ideal for high volume production with a more accurate weight distribution of product, a tighter, cleaner shape and finish without air pockets and, as the system operates at low pressure, helps to prevent damage to the meat.

On the flip side, tooling for a rotary machine is much more costly which can be restrictive if a user has a wide portfolio of products. But if the manufacturer is running high volumes of a standard item, the accuracy and output of a rotary machine makes it the obvious choice.

By comparison, plate forming is much more versatile, less expensive, easy to store, easy to clean and offers fast changeovers.

This flexible equipment forms fresh red meat into virtually any shape for meat balls, steak, beef tartar, burgers and more. It is also ideal for red meat, pork, poultry, seafood, cheese, vegetables and meat replacement products.

In practice plate and rotary formers, despite their overlap, rarely come into competition.

The benefits of flexibility for multi-product, short run operations easily favour the use of the plate formers; for high production operations with a high demand for quality and yield, the rotary is the obvious choice.

Whichever type of technology is used, comprehensive staff training is essential. Global markets are demanding that the use of additives, including salts and phosphates used for water retention in many products, is reduced.

To achieve this, producers need to be acutely aware of the subtleties of their equipment and their staff require training to achieve the required substrate texture, whilst keeping additive use to a minimum.

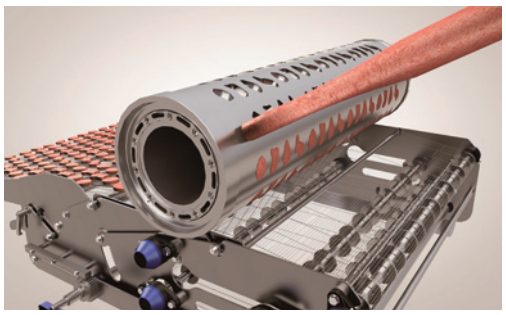
A profitable investment

Naturally, before any decisions are made, food manufacturers need reassurance that any equipment purchased will prove to be a profitable investment.

Feasibility studies, process improvements and R&D tests all need to continue, even during the current Covid-19 crisis.

GEA has a wide range of equipment to meet the needs of formed food producers. The company's engineers and food technologists work closely with customers to ensure that their whole production lines are productive, sustainable, creative, reliable, and efficient with the lowest possible total cost of ownership and total security of outcome. ■

Rotary forming.



Different sets of forming plates.