HOMESTYLE BREADING ON BONELESS AND BONE-IN CHICKEN

Re-creating a unique eating experience on an industrial scale

GEA Engineering for a better world.

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Adding value to boneless and bone-in poultry with delicious homestyle coating

Homestyle breading is a fast growing trend for coating bone-in poultry products like drums, wings, legs, thighs and 8-piece chicken as well as boneless tenders, fillets and chicken popcorn. Even formed products increase in value when given a golden homestyle coating. To re-create authentic homestyle coating in an automated industrial environment, GEA has an integrated line solution that gives the true homestyle look, feel and taste in a highly cost-effective way.

What makes homestyle so appealing?

From quick service restaurant chains to domestic kitchens around the world, homestyle is a firm favorite with consumers. When applied by a practiced hand, the coarse texture of the golden homestyle coating resembles a coral reef, whiles its crispy 'bite' adds to the eating experience. Achieving a balance between flour pick-up, texture and crispiness is crucial to the enjoyment of an authentic Southern fried eating experience.

Traditional homestyle coating by hand

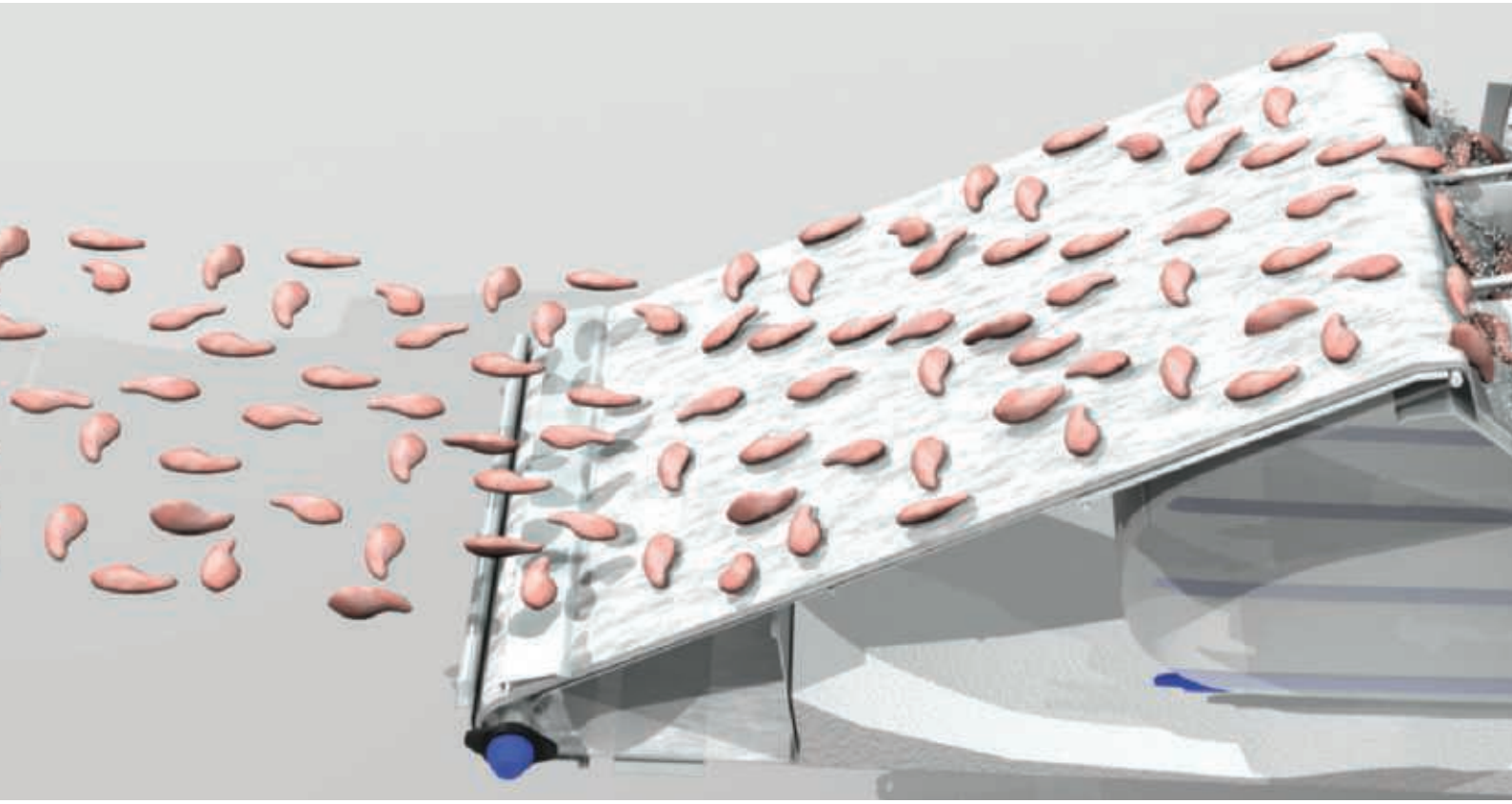
Homestyle is still created by hand in many restaurants because this was considered the best way to get the flakey look and crunchy texture. The procedure involves hand flipping the poultry parts a specific number of times in batters, flour and mixes of spices. Crumbs and browning agents can also be added to modify color and texture. This is a process that appears to be difficult to reproduce authentically on an industrial scale. Food processors are confronted with a dilemma when developing 'heat and eat' poultry products that bring homestyle into retail outlets: compromise on the authenticity of the coating or use a labor-intensive and therefore expensive process. Fortunately, GEA has removed this dilemma with an innovative homestyle line solution.

The process challenges of recreating homestyle coating on an industrial scale are:

- Getting the authentic textured look of the coating, which is formed as the flour and thick batter fold and form creases on the product
- Guaranteeing a consistent all-over coating, even on irregular shaped bone-in poultry
- Achieving the crispy 'bite' by par frying
- Keeping the frying oil clean and free from burnt flour that breaks oil down faster and influences the taste of the end product and shelflife
- Maintaining a high yield by minimizing cooking losses
- Maximizing cost effectiveness by reducing manual labor, minimizing line footprint and maximizing automation

Automatic homestyle breading

To meet the challenges poultry processors face in re-creating homestyle, GEA has developed an innovative multi-drum breader. The patented GEA MultiDrum authentically re-creates homestyle breading and significantly reduces the need for manual labor. Below is an overview of the previously available options for automated homestyle coating.



Flatbed and single drum breaders

The conventional techniques used by poultry processors to apply a 'homestyle' flour coating are using a flatbed breader or a single drum breader. A flatbed breader has difficulty in achieving full coverage and therefore doesn't look like homestyle. To improve the look, seeded flour can be used but this gives a totally different taste, bite and eating experience. Using a flatbed breader in combination with three to five flips also remains a compromise on appearance. A conventional single drum breader, typically with a double pass, does produces an authentic look but is extremely labor intensive and requires converging and diverging of products at the infeed and outfeed respectively.

Single drum versus multidrum breader

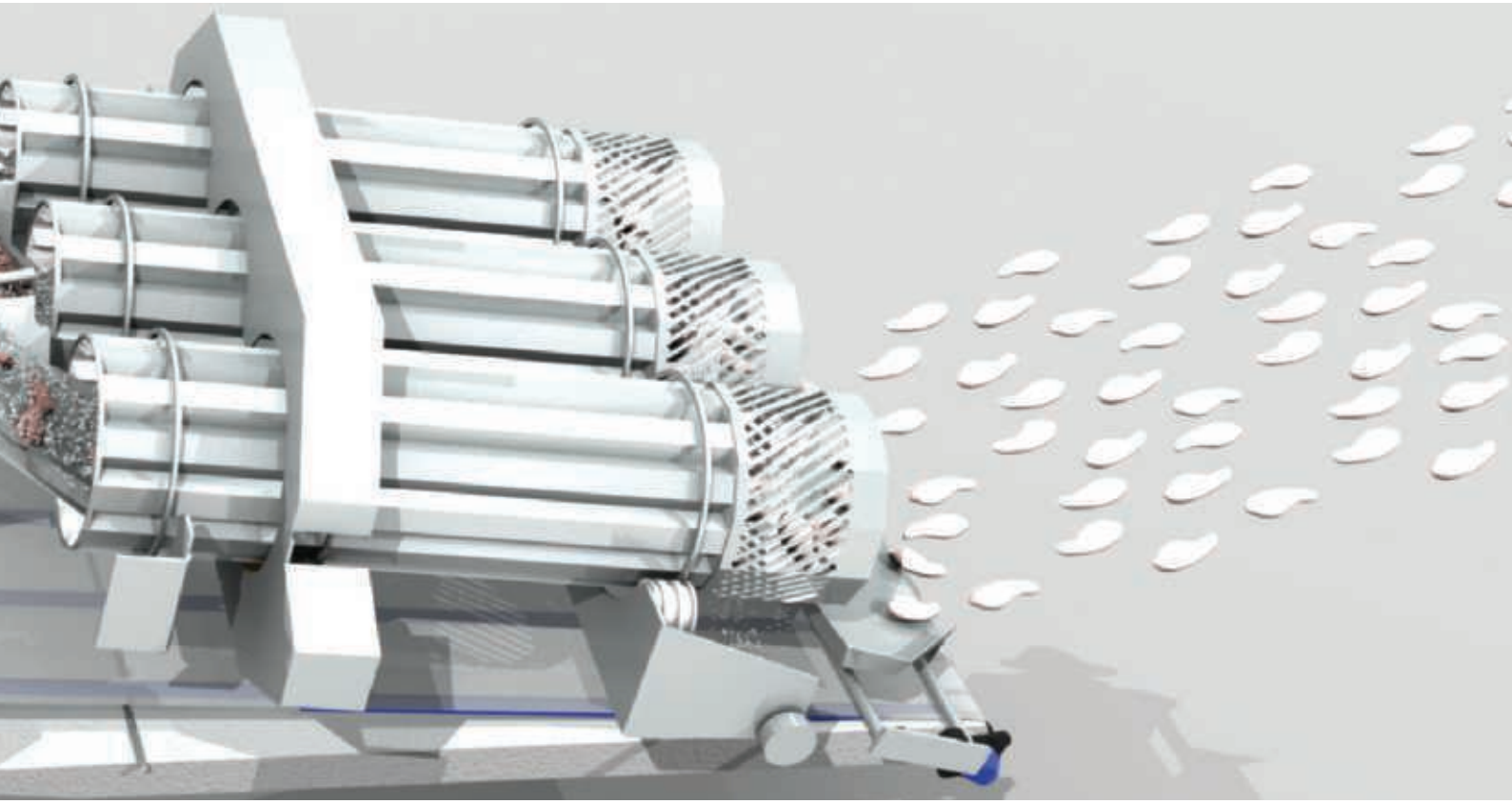
The single drum breader has a large diameter and requires a converger at the infeed and diverger at the outfeed or a lot of people doing this work manually. It produces a reasonable homestyle appearance although the technique has drawbacks. The GEA homestyle breader incorporates two or three rotating drums, for 600 mm and 1000 mm lines respectively.

Single drum

- Products need to be converged at the infeed and spread out at the outfeed, a labor intensive process (up to 20 people)
- The large single drum needs additional equipment, and therefore takes up valuable floor space and has poor access for cleaning
- Wet products are difficult to handle effectively
- Excessive dust is dispersed in the work environment
- Flour is compressed in the augers (which return flour to the infeed) leading to blockage

Multidrum

- Products are bulk loaded at the infeed because there is no need for converging
- Products exit at the outfeed evenly spread in a single layer across the transport with no need for manual labor
- The machine occupies less space than a single drum breader and associated spreading belts meaning shorter lines and better accessibility for cleaning
- A GEA OptiAir (Dust Extraction) can be used to minimize dust in the work environment
- Does not involve augers, which compress the flour and result in blockages



Working principle

Products rise on a chain belt at the MultiDrum infeed and are naturally divided into two or three channels (depending on model). The level of flour on the flour bed is adjustable and kept constant so that the right amount falls into the drums with the products.

There are no augers used to return flour to the infeed, so wet products can be fed into the drums without the risk of blockages forming. Tumbling the products in the rotating drums ensures an authentic homestyle appearance. After tumbling, they exit the drums evenly spread across the belt and the excess flour falls through slits to be recycled back into the machine. Adjusting the drum angle, its rotational speed and the flour dosing at the infeed enables the flour pick-up level to be very accurately controlled.

The total GEA automated homestyle solution

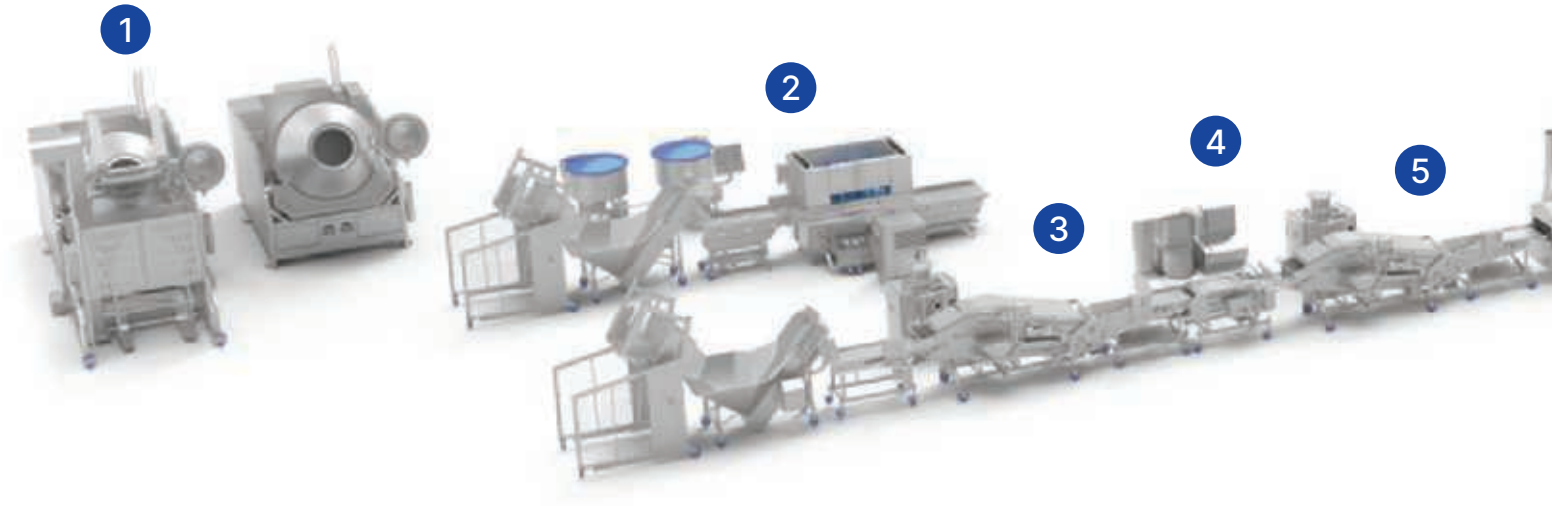
The MultiDrum forms part of a complete coating system from GEA. In the set-up shown, all processes are in tune with each other. This, and a balance between equipment and ingredients, ensures you can achieve a perfect homestyle result and overcome additional challenges.

Additional challenges

For example, the coating system has an impact on the end quality. A homestyle coating has a rugged three-dimensional texture –like a coral reef – so care has to be taken downstream to minimize mechanical impact to the cooked, frozen or chilled coated products. The GEA homestyle coating system overcomes these challenges. In addition to the coating, applying the correct heat treatment also influences the look, taste and bite of a homestyle coating. After coating, the homestyle products need to be flash fried to set the coating. In most processes, the products also pass through in an oven to fully cook the products. These process steps have specific challenges to overcome.

Extending oil life

When frying coated products, the use of flour always influences the life and quality of the cooking oil. Frying is essential to set the coating, and flour will always be left in the oil. Again, GEA has innovative frying equipment that make a significant contribution to the quality and profitability of homestyle products. The GEA EasyFry can be fitted with the high capacity GEA Oberlin Oil Filter that filters out particles down to one micron in size. It is a fully automatic, continuous process that produces dry sediment. Using the Oberlin filter virtually eliminates oil wastage, and ensures a consistent color and taste for the homestyle products. The polluted frying oil is pumped under pressure through a disposable filter media. It has a filter capacity two to three times higher than a centrifuge for filtering similar particle sizes. It filters both sinking and suspended/floating sediment, so there is no need to wait until the sediment burns and sinks as it does in a centrifuge.



1 Defrosting **GEA ColdSteam T**

2 Injecting **GEA MultiJector 2mm**

3 Coating **GEA MultiDrum**

4 Wet coating **GEA TempuDipper**

5 Homestyle coating **GEA MultiDrum**

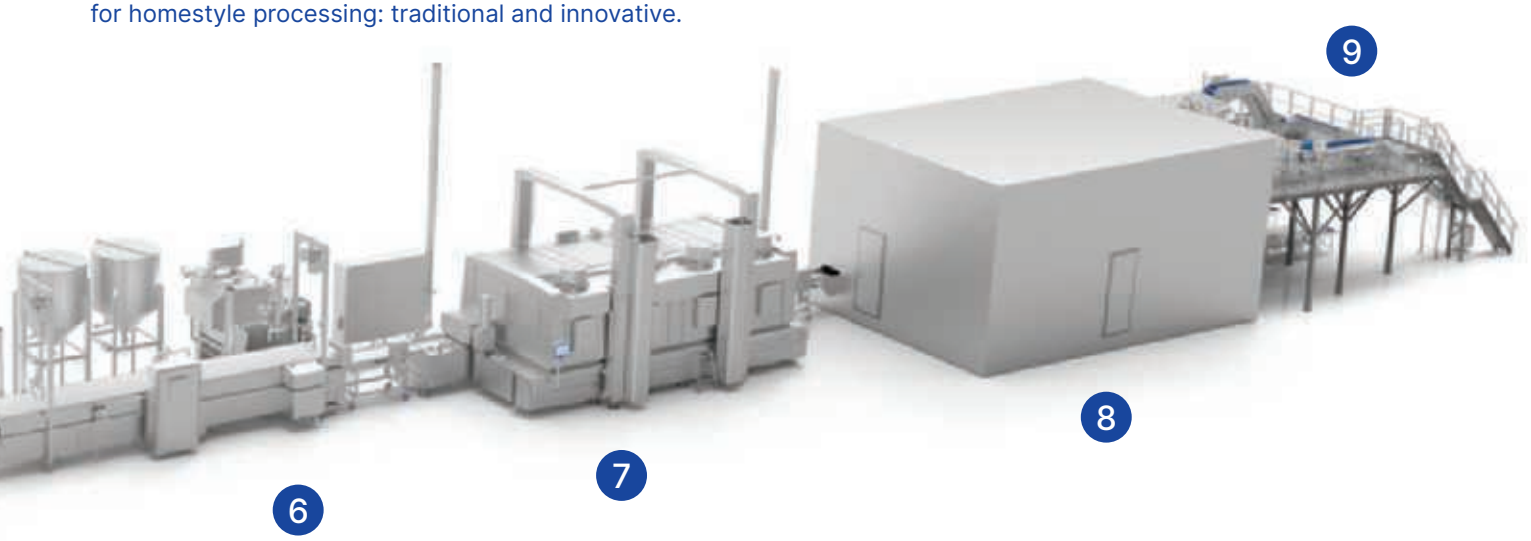
Maximizing cooking yield

When coated products are cooked (after frying), there is a danger that moisture is lost and the yield drops. To overcome this, the GEA CookStar spiral oven provides two cooking zones where the temperature and dew points are independently controlled. In the first zone, a lower core temperature in combination with a high dew point (humidity) seal in moisture. In the second zone, hot air with a higher temperature and lower dew point is used to create the crispy coating so important for homestyle.

The ideal homestyle line

GEA has a full range of best-in-class equipment that can be incorporated into a homestyle line. There are two approaches for homestyle processing: traditional and innovative.

Note that an alternative way to produce homestyle is to 'cook-fry', where the cooking takes place before frying. This can be done using the GEA equipment, although the coral reef texture and crispy bite are not as well preserved in the heat treated product as they are with the traditional technique.



6 Frying **GEA EasyFry**

7 Cooking **GEA CookStar**

8 Freezing **GEA ProEdge Spiral Freezer**

9 Packaging **GEA SmartPacker CX400**

Adding value up and downstream

Before the poultry products even enter the homestyle coating line, GEA has machines for preparing and marinating products to further add value.

There are machines for brine injection, massaging and tumbling that have been specially developed for processing bone-in and boneless products. Homestyle has a rugged three-dimensional texture – like a coral reef – so care has to be taken downstream to minimize mechanical impact to the cooked, frozen or chilled coated products. GEA also offers a complete range of spiral freezers, horizontal thermoformer packaging machines (GEA PowerPak) and vertical baggers (GEA SmartPacker) to enable a complete line solution to be specified with integrated control software for optimum automation. The SmartPackers also include a 'low-drop' version that shortens the distance from the overhead weigher to the bag to minimize damage to fragile products.

Up and downstream equipment

Adding value with injecting...
GEA injectors like the MultiJector have dense needle patterns and thin 2 mm needles that individually retract when hitting a bone and feature individual brine flow control per needle. Delicate chicken wing bones are not damaged, and brine distribution in the meat and around bones is optimized.

... And tumbling
In combination with injection, massaging in a ScanMidi tumbler for shorter periods activates proteins and maximizes the brine pick-up without issues like skin slip. The products also stay drier.

Bulkloading
To complete the in-line production of homestyle products, increase the belt speed and reduce the need for manual handling, GEA developed the BulkLoader P. This solution is particularly suited to loading bone-in and bone-less poultry products via a transport conveyor into the GEA MultiDrum.

Tender aligner

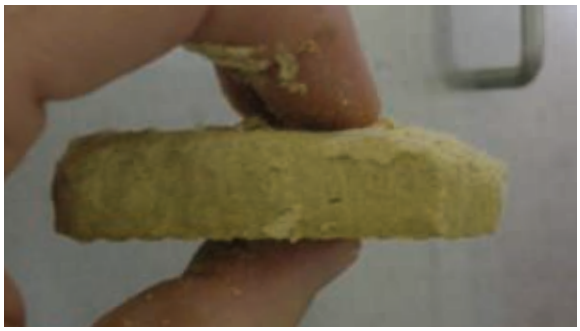
An acknowledged problem with poultry tenders is that they tend to fold, disorient and they can roll at transfer points on the belt and therefore fall between belts and remain trapped. To avoid using intensive manual labor to correct this, GEA has developed the TenderAligner. Poultry tenders are automatically aligned so that they pass over transfer points. This results in better process yield, up to 50% higher throughput and more consistent product appearance.

Frying equipment

To help you lower the costs of industrial frying, our frying equipment is designed to minimize oil consumption, increase productivity and enhance the quality of your products. The range of modular GEA EasyFry solutions - large and small - ensures there is one to exactly match your capacity requirements. Consumer preferences for healthier and crisper fried foods present the challenges for the industrial frying processes, and GEA helps you meet them by providing solutions with optimal control over the fryer and oil filtration equipment.

Filtering equipment

The GEA Oberlin Oil Filter is a high capacity continuously operating pressure filter that is especially suited to coated products. The polluted frying oil is pumped under pressure through a disposable filter media. The Oberlin Oil Filter has a filter capacity two to three times higher than a centrifuge for filtering similar particle sizes. It filters both sinking and suspended/ floating sediment, so there is no need to wait until the sediment burns and sinks as it does in a centrifuge. This means sediment is removed before it starts to affect the oil. It filters particles down to 1 micron, and produces environmental friendly, dry sediment.



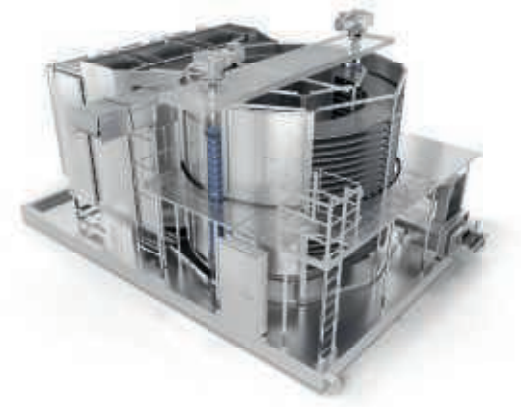
Cooking equipment

When coated products are cooked after frying, there is a danger that moisture is lost and the yield drops. To overcome this, the GEA CookStar spiral oven provides two cooking sections where the temperature and dew points are independently controlled, and a patented 'booster' zone. In the first section, a lower core temperature in combination with a high dew point (humidity) seal in moisture. In the second section, hot air with a higher temperature and lower dew point is used to create the crispy coating so important for homestyle.

Freezing/packaging to complete your line

Freezing

Homestyle products come with an appealing taste and presentation and suit customers' wishes for easy preparation. Food safety at the highest level is a must-have since cold or warm consumption (short regeneration time) will be applicable. The GEA Spiral Freezers are designed for these demanding applications and fully satisfy the strict EHEDG hygienic design requirements whether you chill or freeze. The spiral systems are configured to suit your business drivers and become an integrated part of your operations. GEA's freezers portfolio covers the full range of principles (low-tension, self-stacking and direct drive).



Vertical packaging solutions

The GEA SmartPacker range overcomes the unique challenges associated with packaging of frozen products. Providing the ultimate all-round solution for all your frozen application needs. The SmartPacker is available in intermittent or continuous execution, with a choice of bag formats, smooth film transport with optimal tracking. In humid environments the rigidized shoulder and forming tube use vacuum belts to provide frictionless transport that is unaffected by condensation. GEA's unique process is designed to prevent film and seal contamination, thereby protecting seal integrity. The packaging systems bring ultimate reliability, flexibility, and capacity with lowest possible cost of ownership for producers worldwide.

Putting innovation to work

GEA leads the way in applying innovative technology in meat processing. A pro-active R&D department and superbly equipped Technology Centers to test new ideas, recipes and processes have yielded many process enhancements.

Highlights for in-line homestyle breading include

- Bulk loading of bone-in and boneless poultry products
- Brine injection, massaging and tumbling specially developed for processing bone-in and boneless products
- Accurate control of the coating pick-up percentage combined with the best homestyle appearance on an industrial scale
- Three-phase cooking concept for the highest cooking yields

Your added value

- Cost savings in terms of reduced labor, controlled pick-up levels, flour savings, extended oil life
- A highly controlled process that delivers consistent results in taste, color and quality
- More efficient processing and higher capacity thanks to an in-line process, one operator can run a 1000mm line
- Enhanced food safety due to reduced human contact

Engineering for a better world.

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