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Minimally Processed PET FOOD & TREATS

WELCOME LETTER

WELCOME TO THE LATEST ISSUE OF THE EXTRU-TECHNICIAN.


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» As always, this publication is dedicated to sharing practical insights, technical expertise, and meaningful advances in food processing focused on helping you succeed today and prepare for what's next.

This issue also marks an important milestone. Wenger and ExtruTech are coming together as one, united by JBT Marel. This collaboration brings together decades of extrusion leadership, deep process knowledge, and a shared commitment to innovation. By combining our strengths within the JBT Marel portfolio, we are better positioned than ever to deliver integrated solutions, stronger collaboration, and greater value for our customers worldwide.

A key focus of this issue is the continued evolution of minimally processed pet food production. As consumer expectations shift toward different product formats, nutrition, transparency, and quality, producers face new challenges and new opportunities. In this issue, you'll find insights into processing technology that help support product quality, consistency, and efficiency while keeping pace with a rapidly evolving market.

Whether you've been a longtime reader or are joining us for the first time, The Extru-Technician continues to be a resource grounded in real-world experience, innovation, technical know-how, and a practical understanding of food processing.

Thank you for being part of our community. We're excited about what's ahead and look forward to continuing the journey together united by JBT Marel.

Sincerely,

Rachel Cardwell, *Marketing Director*

The Extru-Technician brought to you by **Wenger & Extru-Tech, united by JBT Marel**

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Minimally Processed PET FOOD & TREATS

How Wenger Is Powering a Growing Niche

By Curtis Strahm

Walk down any pet food aisle today and you can see it: pet parents are looking for something that looks like their own food. They want visible meat, recognizable fruits and vegetables, and products that feel closer to what they might serve themselves. That shift is driving the rapid rise of minimally processed pet foods and treats, and it's reshaping both product development and processing technology across the globe.

Wenger sits in a unique position within this landscape. For decades, we have built on scientific knowledge to help manufacturers bridge the gap between ingredients and final products. We have supplied the systems behind traditional dry expanded kibble, but we also offer solutions for what has become the fastest-growing segment of the U.S. pet food market: minimally processed foods and treats, produced continuously at scale. Leveraging the breadth of

equipment and process solutions that JBT Marel adds to the Wenger portfolio, our fully integrated solutions include equipment and automation that can steam, air-dry, gently dehydrate, bake, cold-form, and cook fresh-refrigerated products. Wenger gives manufacturers a way to bridge the gap between kitchen-style recipes and industrial-scale production.

A New Space Between Kibble and Freeze Dried

Minimally processed pet foods occupy a distinct niche. Retail prices range from about $4 to $25 per pound, compared with economy dry dog food at roughly $1 to $2 per pound. That premium reflects not just branding, but different ingredients and processing choices.

High levels of meat and organs—anywhere from 60 to as much as 99 percent of the formula—are paired with "superfoods" such as blue mussel, fruits and vegetables that consumers readily recognize. Some products feature human-grade meat and organ cuts, and many incorporate by-products like blood plasma or select viscera to maximize both nutrition and sustainability.

These products cut across multiple formats. They can be dry, wet, semi-moist, raw-frozen, or cooked fresh-refrigerated, and they can serve as complete diets, meal toppers, or treats. Appearance matters: irregular shapes, fibrous textures, and visible inclusions signal "real food" and "less processed" to the consumer.

While the minimally processed trend began as an artisanal, small-batch niche, growing demand means brands now find themselves needing continuous production, higher throughput, and tighter control of moisture, water activity, and texture—without abandoning the minimally processed story that made them successful. That is where Wenger's portfolio of process solutions comes into play.

By controlling shear and heat in continuous production and large-batch processes,

manufacturers can create minimally processed diets on a greater scale. Irregular shapes and "non-uniform" structures also play an important role. Rather than relying on a single, consistent geometry, minimally processed products often aim for variation—edges, fibers, differing thicknesses—that visually cue a less industrial, more home-cooked feel. Wenger's equipment enables such controlled irregularity, whether through rope forming and cutting, rotary shaping, or texturizing.

Upscaling Production of Minimally Processed Diets

One of Wenger's core offerings for minimally processed diets is a continuous system built around a steam tunnel followed by optional two-stage roasting and air-drying. This gives formulators a single process platform that can serve dry, semi-moist and wet product lines.

The manufacturer typically starts with frozen meat combined with fruits, vegetables, and other ingredients that are blended and emulsified into a cohesive mass and then formed into long ropes. The ropes enter the steam tunnel, where the product is gently cooked at about 90 degrees Celsius for roughly two and a half to three minutes. This step denatures proteins and gelatinizes starches, improving digestibility and food safety without relying on high mechanical energy. The product is then cooled and cut into pieces.

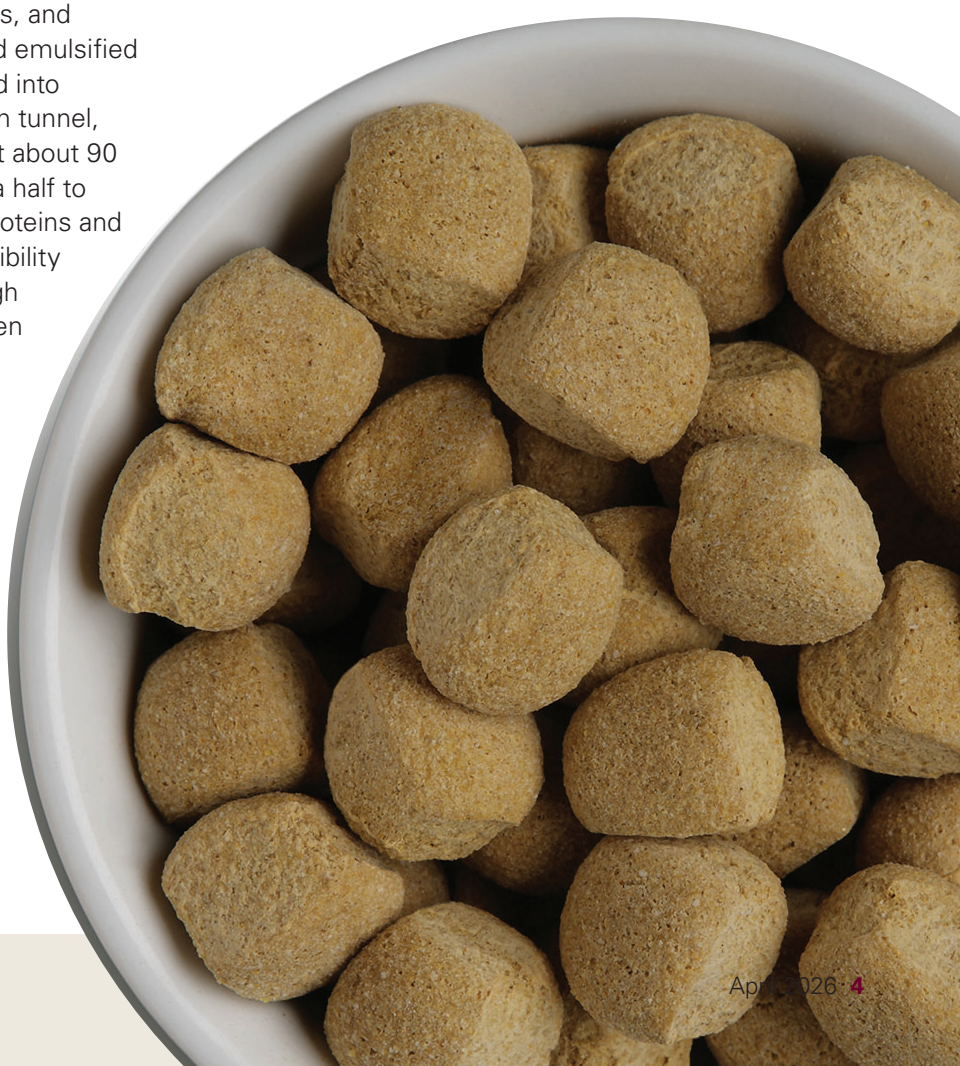
The next step depends on the product desired. For wet formats, manufacturers can portion the cooked product into cans, trays, or pouches and preserve it via retort. For dry and semi-moist formats, they can feed it into a multi-pass convection roaster. If further drying is desired, the pieces then enter a larger, low-temperature air dryer that removes additional moisture.

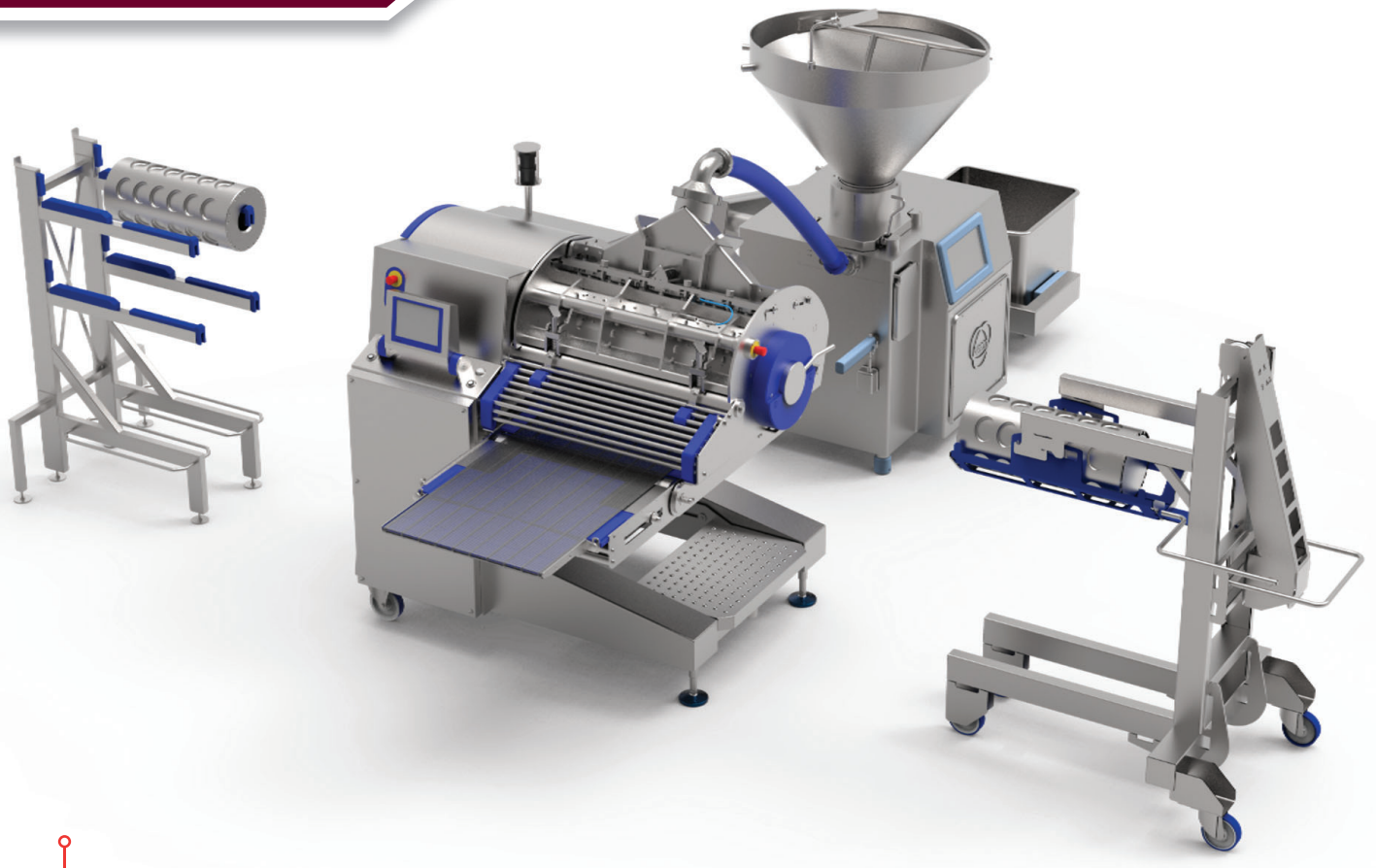
Drying time and temperature in each zone are fully adjustable. That gives manufacturers the ability to tune critical attributes such as bite, internal structure, and color. After drying, the product can be coated with probiotics, fats, oils, flavors, and aromas, then cooled and sent to packaging.

PowerHeater®: Texturizing with Minimal Processing

While the steam tunnel approach focuses on direct steam cooking, Wenger's PowerHeater technology offers an alternative route to gentle processing and high-value textures.

Here, the mix of meats, organs, and dry ingredients enters a screw system where steam circulates through the barrel but does not come into direct contact with the product. This indirect heating gently cooks the recipe while the screw action creates fibrous, meaty structures. Because the heating is indirect, the system also maintains the minimally processed narrative.





Wenger's RevoPortioner forms pieces through a rotating die at pressures below about four bar to reduce the mechanical and thermal energy associated with traditional extrusion.

The texturizing capability allows manufacturers to leverage cost-effective ingredients such as trimmings, mechanically separated meat, or organ blends, while still delivering an appearance and texture that consumers associate with whole muscle meat. The technology is equally capable of texturizing plant proteins, enabling vegetarian or hybrid recipes that, while still niche, respond to evolving consumer interest in alternative proteins.

PowerHeater output can be moved into cans, pouches, or trays for wet offerings, or it can be routed into the same two-stage roasting and air-drying system described earlier for dry or semi-moist products. Visual inclusions, such as vegetables or fruit pieces, can be incorporated to reinforce "kitchen logic" on the label and in the bowl.

By combining texturization and gentle heating in a single step, the PowerHeater helps bridge the gap between artisanal meat cooking and continuous, scalable production.

RevoPortioner: Shaping Imagination into Product

Minimally processed products do not just need to be "real food"; they need to look the part. That visual storytelling is where Wenger's RevoPortioner rotary die system comes in.

The RevoPortioner accepts a pumpable mix of meats and dry ingredients and pushes it through a rotating die. Because it operates at relatively low pressures—below about four bar—it forms pieces without the high mechanical or thermal energy associated with traditional extrusion. At the die, almost any two or three-dimensional

shape can be created, from simple nuggets and chunks to intricate, branded silhouettes. Formed pieces are gently ejected and dropped onto a conveyor, where they can be fed into various downstream processes.

Afterward, the product typically goes to a steam tunnel or impingement oven to cook the product to the required internal temperature. A short air-drying stage follows, finishing the moisture profile before the product is coated and cooled. RevoPortioner capacities range from about 100 kilograms per hour at the low end to 5,000 kilograms per hour or more, giving both emerging and established brands room to grow.

Protecting Sensitive Ingredients with Forming Extruders

Extruders are often associated with high shear and heat. But for the minimally processed niche, Wenger provides forming extruders designed around low-energy shaping into ropes, clusters, or pieces. The product exits the extruder essentially raw or only lightly warmed.

To further protect sensitive ingredients, chilled water can be circulated around the extruder barrel. This "cold-forming" approach actively manages the temperature, helping retain the desired nutrient, color, and texture profile while still allowing accurate shaping.

From that point, the possibilities branch out: products can be kept raw and frozen, steamed and served fresh-refrigerated, air-dried, freeze-dried, or finished as semi-moist treats. The processing philosophy is consistent: separate shaping from cooking, only applying heat when it is needed.

Automation, Capacity, and Sustainability

Minimally processed products cannot remain small-batch forever if they are to meet national and global demand. By taking labor-intensive operations and translating them into continuous, automated systems, Wenger helps brands scale without diluting their core proposition.

Automation brings multiple benefits. Labor costs fall, and operators can focus on oversight and quality control rather than constant hands-on intervention. Process parameters—time, temperature, airflow, belt speed—can be held within tight limits, improving uniformity in moisture content, water activity, and product structure. At higher capacities, often exceeding several thousand kilograms per hour, these systems make it feasible to expand distribution from regional to national and even international markets.

Sustainability considerations are built into many of the process options. On forming equipment, closed-loop chilled-water systems limit waste and energy use. On dryers and roasters, heat-recovery solutions can capture exhaust energy and route it back into the inlet side of the dryer or into hot water systems elsewhere in the plant. By reclaiming and reusing heat, manufacturers can reduce both environmental impact and operating costs.

Crucially, many of these features are modular and can be added as a plant grows. A manufacturer might begin with a basic steamed and air-dried line, then later integrate PowerHeater capacity, a RevoPortioner, or additional baking and cold-forming steps to diversify the product range. This future-proof design allows innovation to proceed incrementally rather than demanding an all-or-nothing investment.

Wenger's Full-Spectrum Advantage

The rise of minimally processed pet foods has not replaced traditional kibble. Instead, it has added a new spectrum of choices. Wenger continues to provide the systems that produce dry expanded diets, from basic economy formulas to ultra-high-meat kibbles with vegetable and fruit inclusions. Those products remain the daily staple

for many households, prized for affordability and convenience.

Wenger, with broadened end-to-end solutions as part of JBT Marel, has also built a complementary portfolio of process solutions for the fastest-growing segment in the market: minimally processed foods and treats. With options for continuous steaming, air-drying, gentle dehydration, baking, cold-forming, and cooked or fresh-refrigerated offerings, Wenger enables manufacturers to deliver minimally processed pet food at scale while staying true to the category's promise of gentle handling and high meat content.

In an era when pet parents expect their animals to eat as well as they do, that full-spectrum capability matters. It allows brands to meet consumers where they are—whether that is a bag of traditional kibble, a jar of air-dried meat bites, or a pouch of fresh-style chunks that resemble something from a home kitchen. And it ensures that as the definition of "pet food" continues to evolve, the technology behind it is ready to evolve as well.

Contact Curtis Strahm, cstrahm@wenger.com, to start developing your minimally processed solutions. We exist to innovate and help develop your products and processes

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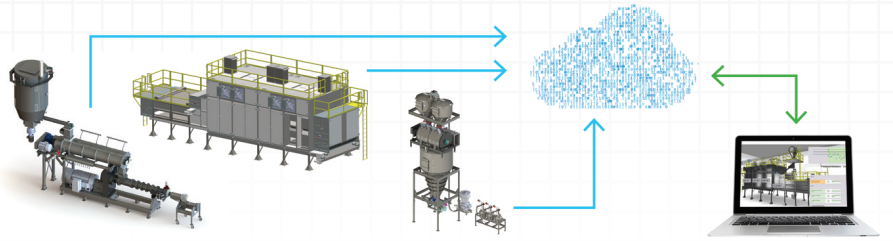
POWERED BY TWINTHREAD

EXPRO AI™ THIS CHANGES EVERYTHING

HOW CAN ARTIFICIAL INTELLIGENCE (AI) ENHANCE YOUR EXTRUSION OPERATIONS?

Artificial intelligence in manufacturing monitors and analyzes large data sets over time to recognize process patterns and then uses learning and intelligence, similar to the human mind, to predict outcomes and make decisions to achieve pre-set goals.

EXPRO AI™, Powered by TwinThread, applies advanced machine learning concepts to optimize extrusion cooking and drying processes used to produce pet food, human food, and aquatic feed. By monitoring and evaluating key variables throughout the extrusion process, EXPRO AI can provide real-time situational predictions, recommendations, and automated actions to maximize product quality and process efficiency in a repeatable, consistent manner. Contact Wenger or Extru-Tech today.



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