

A top-down view of a wooden surface with various pet food ingredients. On the left, a white bowl is filled with brown, round kibble. Scattered across the wood are several individual kibble pieces. In the bottom left, there are sliced orange carrots and green cucumbers. The wood grain is prominent and runs horizontally.

Meeting Pet Food Demands

AS CONSUMER TRENDS CONTINUE TO CHANGE

INTRODUCTION

Pet ownership, buyers' expectations, and the pet food manufacturing processes are changing. All of these changes require the pet food processing industry and pet food processing equipment to make changes as well. Industries and businesses that remain stagnant and refuse to adapt to new changes tend not to last very long. Or, at least not as long as their adaptive counterparts.

Automation has allowed pet food manufacturers to meet these changes head-on. In this guide, we'll discuss some of the biggest innovations and trends in the pet food processing industry, and automated equipment that can optimize pet food processing, providing more efficiency, safety, and higher quality, no matter which type of pet food you are making.

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OVERVIEW:

How is Pet Food Processing Changing?



Overview: How is Pet Food Processing Changing?

Pets are Family: The days of keeping a pet outside, in a dog house or in a barn, are pretty much gone. About 88% of pet owners now consider their pet to be a family member (1). About 66% allow the pet to sleep in bed with them. As pet owners become closer to their pets, they're taking a deeper look at ingredients, safety, and nutrition of the food they give them and expecting options more in line with what they eat themselves.

Pet Ownership is Increasing: According to the 2021-2022 American Pet Products Association National Pet Owners Survey, about 70% of U.S. households own at least one pet (2). Though numbers vary somewhat depending on the survey and methodology, it's clear that pet ownership has increased in America, and in many other parts of the world as well. This means the market for pet food and treats is expanding.

E-Commerce is Growing Fast: According to Petfoodindustry.com, online sales of pet food and supplies rose much faster than expected in 2020. Pre-pandemic, market research analysts predicted e-commerce to account for 25% of the pet food market only by the year 2025. In 2020, e-commerce sales accounted for 27% of sales and are now predicted to hit 35% by 2025. (3)

Growing Variety in Pet Foods: According to the same report, though kibble still remains the most popular type of pet food, "kibble plus" (a mix of dry kibble with freeze-dried pieces) now accounts for 9.5% of sales. Completely freeze-dried pet food follows with 2.4%, and dehydrated pet food with 1.4%. Freeze-dried pet foods saw turbulent rises and falls throughout the year, with 13.3% sales growth in August that declined in other months. Frozen pet foods also increased about 13% in August.

1. <https://today.yougov.com/topics/society/articles-reports/2019/12/13/how-americas-pet-owners-feel-about-their-furry-fri>
2. http://americanpetproducts.org/pubs_survey.asp
3. <https://www.petfoodindustry.com/blogs/7-adventures-in-pet-food/post/9883-pet-food-by-the-numbers-2020-edition>

How Can Pet Food Processors Respond?



How Can Pet Food Processors Respond?

Increasingly, customers are looking for better ingredients and more ingredient transparency for their pets' food. This has led to an increase in freeze-dried, dehydrated, refrigerated and frozen pet foods. Keeping costs down, and producing an affordable, high-quality product while maintaining a profitable operation can be a challenge. Streamlined automation can help accomplish this in many ways. We'll take a look at each of these in more detail later in the guide.

- ▶ **Increased transparency:** Automated batch control systems make it easy to record, track, and trace ingredients from receiving to production to shipping to purchase.
- ▶ **Faster Production:** Eliminating mechanical or manual activities means putting out more product in a shorter timeline.
- ▶ **More Accuracy:** Automation can eliminate human error and also improve weighing systems, resulting in products that are more uniform and nutritionally consistent.
- ▶ **Better Quality:** Optimized mixers, weighing instruments, coating equipment and more means all types of pet food products can be more appealing to pets and buyers, from taste and textural elements to the detection and elimination of contaminants to the incorporation of innovative ingredients.

Receiving



Receiving

Tracking and tracing ingredients is important throughout the pet food manufacturing process, and that starts with receiving. Whether you're receiving raw ingredients from a refrigerator truck for premium pet food, standard bulk ingredients for bagged food, trace vitamins, minerals and enzymes, or, more likely, a combination of ingredients, it's important to track these ingredients and where they go. An automated batch control system streamlines track and trace at the receiving stage.

- ▶ **Barcode Scanning:** An automated bar code scanning system is the best way to track and trace your ingredients at receiving. This system not only records ingredients, but the automated system will also send them in the right direction, to the next process.
- ▶ **Weighing and Metering:** An interconnected weighing and metering system also helps to make ingredient receiving easier and safer. When employees weigh or distribute ingredients by hand, either through a mechanical system or by measuring ingredients with scoops, there's room for error. An automated system, when properly calibrated and maintained, will weigh the right amount of each ingredient, record this measurement, and send the ingredient to the appropriate bin or holding area.
- ▶ **Automated Batch Control:** An automated batch control system also allows you to change your ingredient mix or improve your system further without a complete overhaul. By reprogramming key components, you can adjust your recipe and your receiving process. As consumers become more exacting and trends change, this agility can be especially important.

Weighing and Measuring



Weighing and Measuring

Accurate weighing and measuring of ingredients is important at receiving to be sure the proper amounts of each ingredient arrive at the right places in the plant, but it's also important during the production process. From macroingredients like corn and grains to microingredients like palatants and enzymes, accuracy is essential to creating a high-quality product, and reducing costly ingredient waste. However, this process also has to be fast and efficient. The right automated weighing and measuring system during the production process will accomplish both.

- ▶ **Macroingredients:** For macroingredients, accuracy is generally less important than speed. Finding the right hopper and scale, and coordinating operations can help to improve the speed at which macroingredients move through the process. The right design can also help to remove dead spots and prevent material segregation, which can easily occur with grains.
- ▶ **Microingredients:** For microingredients, accuracy is often more important than speed, though both are necessary for efficiency. An automated microingredient system will weigh and meter microingredients with pinpoint accuracy, and prevent errors or mismarks that can occur when hand-adding microingredients.

Mixing



Mixing

With ingredients quickly and accurately measured, fast and efficient mixing is the next step in the process. It's essential to get a homogenous mixture, but the mixer also has to be able to process the material quickly. Optimizing the mixer according to your ingredients can help to maintain homogeneity, prevent failures and downtime, and mix ingredients fast.

- ▶ **Thick ingredients:** When working with thick pastes, such as those for wet pet food, it's helpful to consider the consistency of the ingredients. A paddle mixer may work better than a ribbon mixer in these instances. Or, a double ribbon mixer may mix ingredients more thoroughly. Finally, if the mixture is very thick, the mixer may need choppers to break apart clumps, and a stronger motor to run.
- ▶ **Dry bulk:** A ribbon mixer is ideal for dry materials, however a few considerations can optimize the mixer's operation to prevent problems like dead spots, flushing, and overmixing. Outfitting the mixer with the right type of ribbon and number of spokes, for example, can create a better quality mix. Choosing the right discharge gate, a stainless steel finish and food-safe welds, and the right-sized motor are also important considerations.
- ▶ **More texture:** In some cases, completely uniform mixing might not be the desired result. To achieve more texture, take a closer look at the mixer. Testing mixing time, using paddles, or changing the design can help create the desired result.

Extrusion



Extrusion

With the ingredients mixed, extrusion is the next step in the processing chain for kibble and dry pet food. The extruder must be efficient as well as sturdy to get the pet food mix into properly sized and shaped pieces.

- ▶ **High meat mixes:** Pet food which uses a higher meat content can present challenges for many extruders. Twin-screw extruders are ideal for these products.
- ▶ **Food-safe manufacturing:** If the extruder isn't properly manufactured and maintained, metal fragments can chip off and contaminate the pet food. The extruder should be made from food-grade stainless steel with careful attention to welds.

Coating

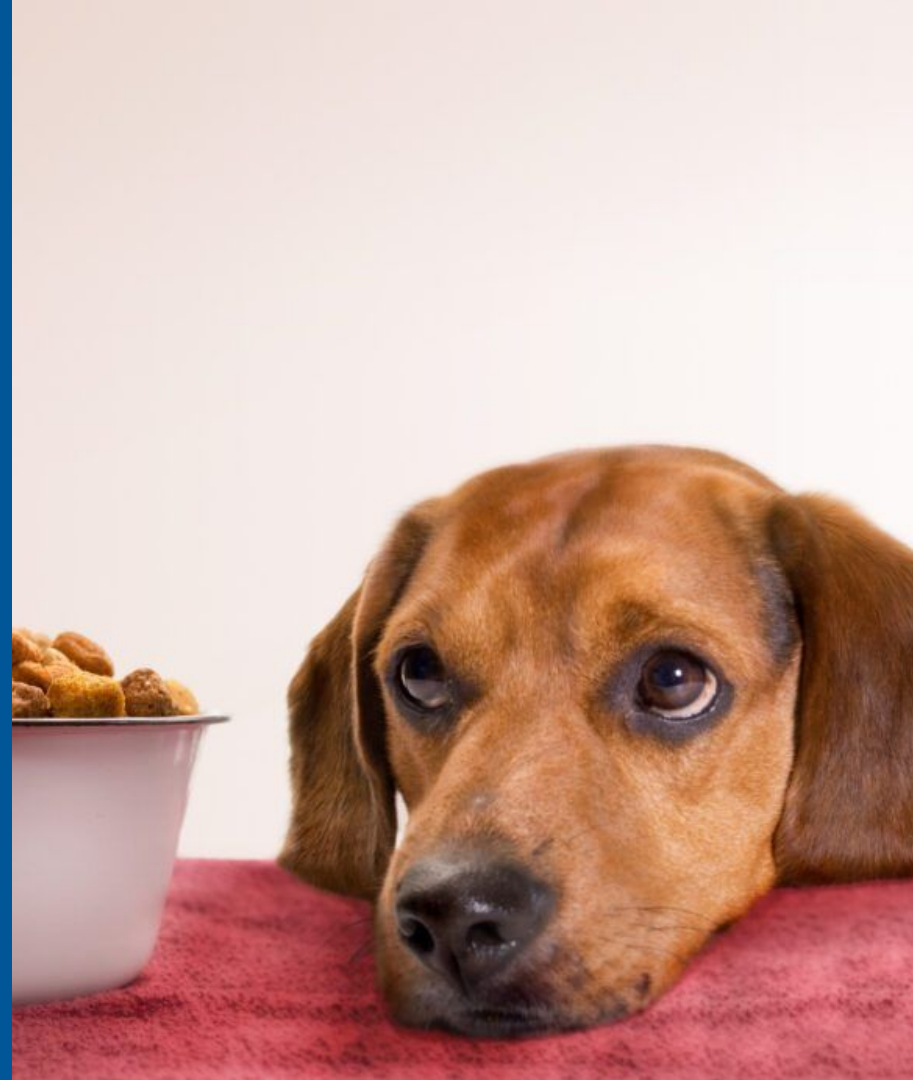


Coating

Adding liquid or powder coatings to pet food is an important process. These coatings often make or break how appealing the food is to the pet, and also have an important impact on their nutritional value. When your coating equipment works effectively and doesn't require a lot of maintenance, your operation will be more efficient and your products will have better quality.

- ▶ **Spray Coating:** Spray coating is a common way to add liquid coatings, like fats or oils, onto pet food pellets. However, fats, oils, and salts can create problems for some spray coating equipment. This equipment can become clogged by solidified fats or salt crystals, and may require frequent cleaning.
- ▶ **Mist Coating:** Mist coating atomizes liquid coatings into a fine mist using a quickly rotating disk. The pet food then falls through an enclosed chamber, through the mist, and receives an even coating. This process doesn't clog at the same rate as spray nozzles, and generally requires less maintenance.
- ▶ **Powder Coating:** Effective powder coating generally requires a liquid coating process in addition to the powder. The liquid coating allows the powder to stick to the pellet, and an additional liquid coating process may improve sticking further. Spray coating for the liquid additives as well as an effective powder coater will both be important considerations.

Drying and Cooling



Drying and Cooling

After coating, the drying and cooling processes allow the coating to properly absorb. This process is also essential to prevent condensation from accumulating during packaging, which can cause mold and other issues. As coatings have changed somewhat over time, the drying and cooling process has had to change as well.

- ▶ **Resolving clogs:** If you're using a coating with a high fat content and you're using a horizontal cooler, you may notice the perforations in the conveyor are easily plugged, and the airflow doesn't move through the cooler effectively. Upgrading to a vertical cooler can help solve this problem.
- ▶ **Vertical limitations:** A vertical cooler might not always be possible. If your facility has limited vertical space, some manufacturers provide horizontal coolers with perforations that are resistant to plugging.

Tracking

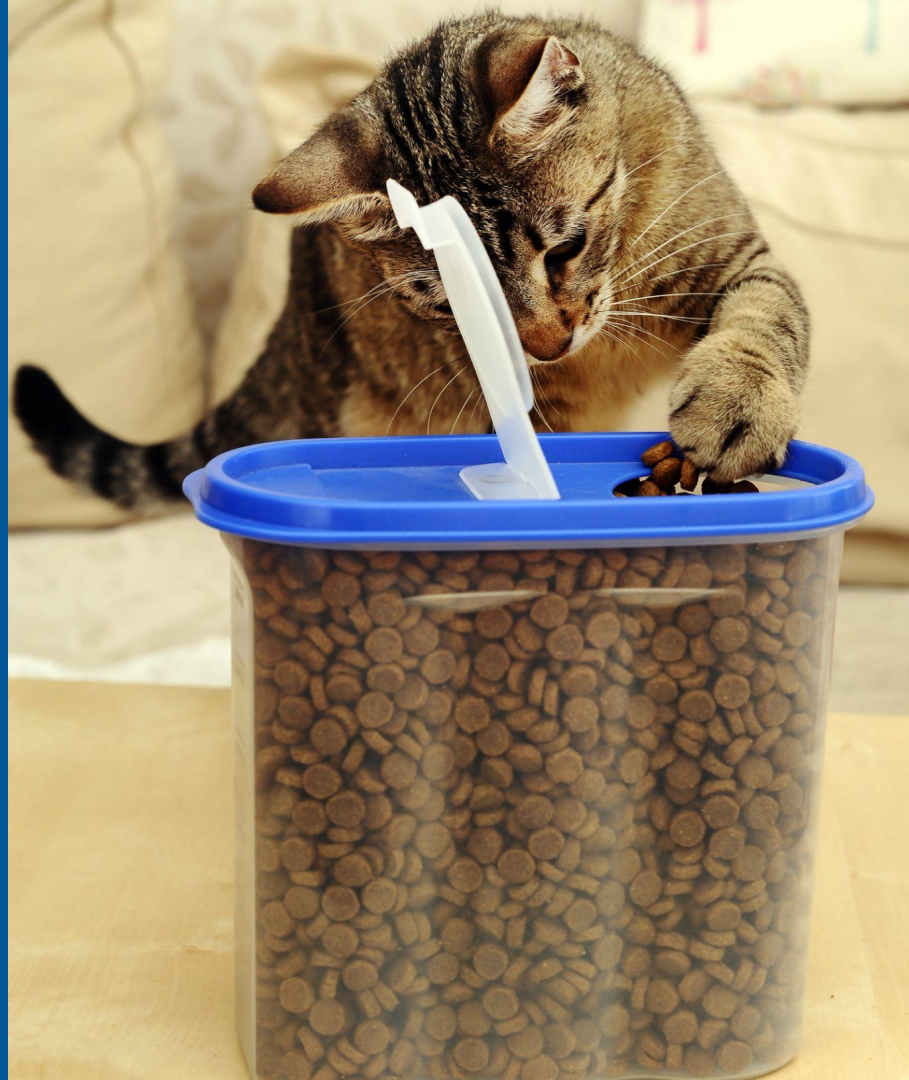


Tracking

The automated batch control system helps to track ingredients throughout the process, and trace them to the final, finished product. This system is important for FSMA adherence, and also for product safety. If any ingredients were contaminated, or if the product was contaminated at some point in the manufacturing process, the tracking system will allow you and other stakeholders across the supply chain to pull the contaminated products from shelves.

- ▶ **Practice Recall:** To make sure the tracking system works, and to make sure all employees know what to do in the event of a recall, it's helpful to perform a mock or practice recall. This will show how well the system works, and whether or not it can be relied on if contamination occurs.
- ▶ **Maintaining the Tracking System:** For the tracking system to work, it needs to be put to the test (see above), but it also has to be maintained. While automation can make many systems faster and more reliable, they need some supervision to ensure they're working properly. Check to make sure your tracking systems are recording information properly, weighing instruments are accurate, and the starting ingredients really end up where your system says they do.
- ▶ **Full-scale Visibility:** Without full visibility across the supply chain, tracking and tracing isn't very effective. All your processes and devices should work together to support full-scale visibility. It should be easy to detect where ingredients came from, which ingredients are moving to which batch, and where that batch is going. Without full-scale visibility, you may end up with contaminated ingredients without accountability, or contaminated products you can't pull from shelves.

Storing and Packaging



Storing and Packaging

Before the finished pet food product can go on to distribution, it must be stored and packaged. At this stage, retaining freshness and quality is critical, and can be a challenge. Temperatures and humidity levels in and around the storage area must be carefully monitored. Also, the area must be inspected for any pests. Finally, the packaging must be able to preserve the pet food.

- ▶ **Preventing condensation:** If temperatures outside the storage bin are at or below the dew point temperature of the air inside, condensation will accumulate at the top of the bin. This will drip down into the food, and can create mold. To prevent this, it's important to monitor the previously mentioned cooling step as well as the storage environment.
- ▶ **Sustainability challenges:** Pet food packaging must have a long shelf-life, but pet owners are increasingly looking for sustainable packaging as well. Many pet food manufacturers are looking at recyclable packaging and resealable containers to align with buyers' interests.

Optimize Your Pet Food Manufacturing Process

As consumers' demands become more defined and the need for pet food of all types increases, automation provides solutions for both product quality and production efficiency. Whether you want to speed up a single process or outfit a new plant with the best pet food processing equipment, we can help. Tell us about your goals and we'll design custom-fitted equipment for your facility.

Talk With the Experts Today!



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