Revolutionizing Pet Treat Innovation with REV™ Technology

Unlock the speed, precision and creative freedom R&D teams need to pioneer the next generation of premium pet treats.

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Table of Contents

Executive Summary

The pet food and treat industry is evolving rapidly, driven by scientific innovation, functional nutrition, sustainability goals, and rising expectations for premium, clean-label products. Yet one persistent bottleneck continues to slow R&D teams, process engineers, and commercial manufacturers alike: drying technology.

Freeze drying, while known for preserving quality, imposes cycle times of 24–48+ hours, demands high energy inputs and restricts texture possibilities. These constraints slow down product development pipelines, delay commercialization, and hinder innovation.

EnWave's REV™(Radiant Energy Vacuum™) technology introduces a transformative solution.

By combining volumetric microwave energy with vacuum drying, REV™ enables:

Fast, gentle drying

About 25x faster than freeze-drying

Opportunity for Innovation

Never-before-seen products

Higher quality products

Better nutrition, flavor, texture, composition

More control and consistency

Precise, volumetric, customized drying

Reduced footprint

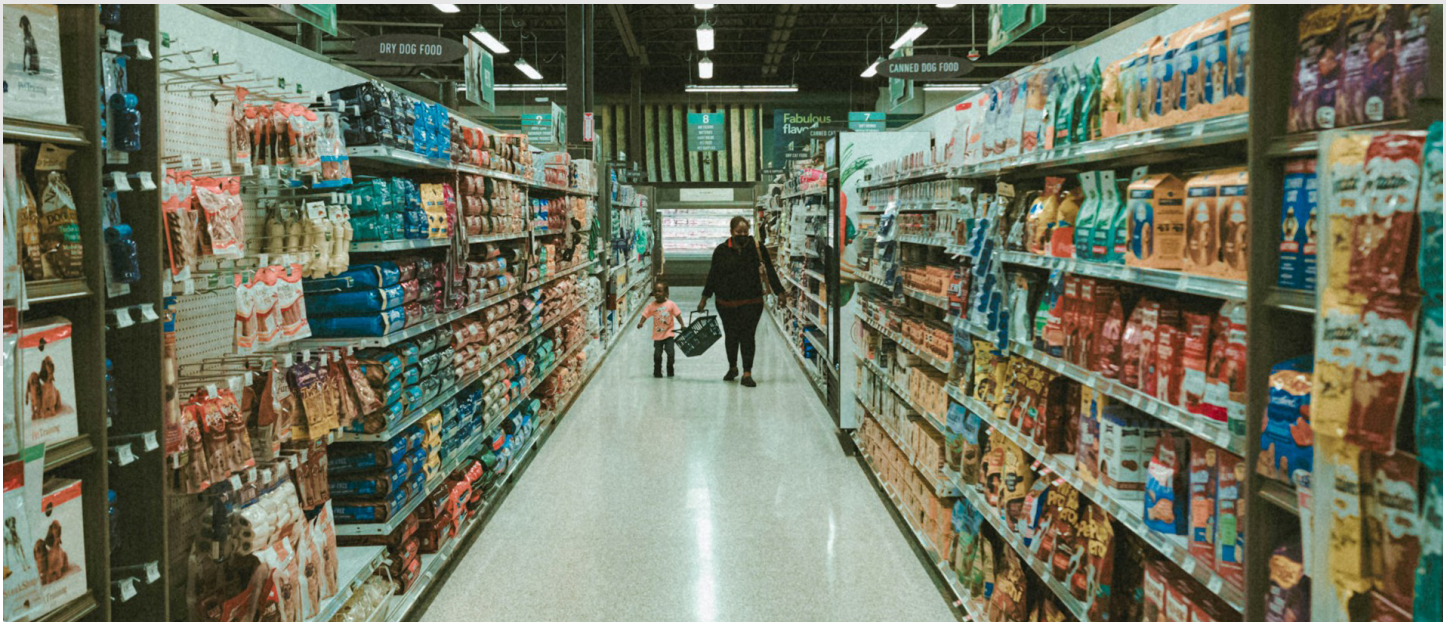
Up to 30% less space than traditional drying

This whitepaper details how REV™ empowers pet food innovators to move faster, experiment more freely, bring science-driven products to market sooner, and differentiate with superior product performance.

Introduction

Pet owners increasingly prioritize health, functionality, and natural ingredients in the products they choose for their pets. This shift has intensified the need for R&D and product development teams to deliver nutrient-dense, sensory-driven, innovative treats that also meet shelf-stability, safety, and regulatory requirements.

Yet many product concepts stall due to drying limitations. Freeze drying (once considered indispensable) is no longer compatible with the accelerated innovation cycles required to stay competitive.

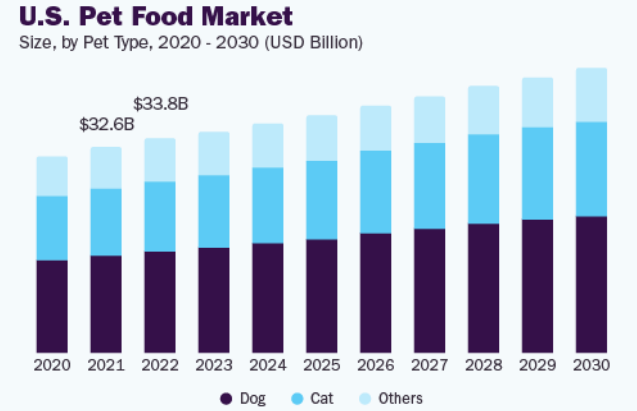


REV™ vacuum microwave dehydration provides a new foundation for next-generation pet treat development, enabling brands to create high-performing products at the pace today's market demands.

PLUS

- Upcycle produce
- Minimal CO2
- Conserves water
- Energy efficient

The Market



- U.S.: $11.3B dehydrated pet food market (2022), 10% CAGR to 2026; 80% dog treats share, cat treats rising.
- Europe: Germany (3.5% CAGR), France (4.4% CAGR to 2034).
- Global: China pet treats at 9.1% CAGR by 2034.

Consumer Demands Reshaping Product Design

Pet parents increasingly seek:

- Novel proteins (marine-based, insect, plant-forward)
- Treats with superior aroma, texture, and palatability
- Functional, science-backed nutrition
- Clean-label and minimally processed ingredients

As innovation accelerates, drying technology becomes central. it must preserve nutrition, unlock new textures, ensure safety, and enable meaningful differentiation.

The Problem with Traditional Drying

Freeze Drying Limitations for R&D and Scale-Up

- Cycle times of 24–48+ hours, slowing iteration and commercialization
- High energy consumption, raising operational costs
- Texture constraints, often producing brittle or too soft and airy textures
- Scale-up complexity, making transitions from R&D to production slow and costly

For R&D teams committed to rapid prototyping, functional ingredient testing, and new format exploration, freeze drying becomes a structural obstacle.

> “
>
> We were searching beyond freeze drying for innovations that deliver more.
>
> As one EnWave partner noted.

Proposed Solution

REV™ Vacuum Microwave Dehydration

Radiant Energy Vacuum™ combines two powerful mechanisms:

- Microwave energy for uniform volumetric heating targeting water molecules
- Vacuum pressure to lower the boiling point to ~25°C, protecting sensitive nutrients

Key Advantages for Innovators and Manufacturers

- 45–60 minute drying cycles (vs. days)
- Gentle, low-temperature drying protects color, aroma, and functional nutrients.
- Precise moisture control for crunchy or chewy textures.
- Consistent, uniform drying eliminates case-hardening and texture inconsistency.
- No need to puncture non-porous ingredients (e.g., fruit skins).

Want to see the advantages for your product?

Work with our team of experts to run a series of product trials at our Canadian pilot plant facility. Gain access to our extensive library of REV™ dried protocols and processing parameters and leave with a batch of samples to taste and review.

Book a discovery call today for details on all of our product development packages.

A trusted partner in 24 countries, and counting.

Case Studies

Acceptability Study (2019, USDA-Registered Facility)

20 Beagles tested REV™ dried treats.

- Chicken Hearts: 100% (4,000g/4,000g)
- Chicken Livers: 97% (3,874g/4,000g)

These results show REV™'s ability to preserve aroma, flavor, and texture drivers that directly impact palatability.

REV™ Dried Product Applications

REV™ has been successfully used to produce:

- Meatballs and jerky-style pieces
- Single-ingredient organ treats
- Cheese puffs
- Meat–fruit–vegetable hybrid treats
- Lamb chews, beef patties, chicken breast snacks
- High-protein and functional inclusions

If you have a specific product in mind, get in touch with us, we're ready to explore your ideas and help you turn them into reality.

REV™ dried Lamb Treats

REV™ dried Chicken Breasts

REV™ dried Beef Chews

Case Studies

BLUEBERRIES

	AIR DRYING	FREEZE DRYING	AIR DRY + REV DRY
Drying Time (hours):	10 - 18 hours	24 - 48 hours	2 - 3 hours
Moisture (%)	< 5 %	< 3 %	< 3 %
Density (G/ml)	1.1	0.3	0.4
Antioxidant Activity: (µmol Trolox Equivalent / g solid) / ABTS	102	133	102
Vitamin C Retention: (% Retention)	26.07 %	84.49 %	79.26 %

Conclusion

Freeze drying has long served the industry but is increasingly misaligned with the pace and needs of modern R&D, product design, and manufacturing.

REV™ Vacuum Microwave Dehydration provides a faster, cleaner, more sustainable alternative that preserves nutritional integrity while dramatically accelerating time-to-market.

For innovators seeking differentiated textures, functional nutrition retention, energy-efficient production, and commercial scalability, REV™ represents the next frontier in pet treat manufacturing.

Discover how REV™ positions your brand for explosive growth in the $11B dehydrated pet market.

Premium Products Start with Smarter Drying

Unlock your team's full innovation potential by integrating REV™ into your development and production workflow.

Access your REV™ Pet Treat Processing Deck with the QR Code below and visit us at Pet-food Forum Booth 2040, April 2026, Kansas City.