Watson

Nourishing **Innovation** in Companion **Animal Health**

NUTRITION AND INNOVATION FOR COMPANION ANIMALS

A good, balanced diet complete with vitamins, minerals, and key nutrients is essential for the health and well-being of the entire family. Today, many people include their pets in the definition of family. How we feed and care for our pets has changed dramatically.

Consumers are looking for more variety, better nutrition, and many of the same options they want for the human members of the family, including gluten-free, GMO free, organic, and weight-loss promotion.

Food-safety concerns and a desire for high-quality ingredients for pet foods parallel that of the food industry. Pet food manufacturers are creative and innovative in their search for foods that will enhance the bond between human and pet, while meeting consumer demand for health-promoting foods.

Watson supports our customers in the pet food industry with ingredients, technology, and innovation, to help ensure their big ideas become the successful products of the future.

- **Ingredients for pet foods and treats:**
  - Chelated minerals
  - Custom nutrient premixes
  - Edible Glitter™ for flavor changes and customized nutrition
  - Edible Films for low-calorie treats
  - Fibers – brans and germs
  - Micro-encapsulated nutrients for taste-masking and stability
  - Natural mold inhibitors
  - Spray Dried ingredients
  - Triturations
- **Ingredients for animal health supplements:**
  - Custom vitamin and mineral premixes
  - Drum-to-hopper nutrient blends
  - Edible Films - novel delivery systems
  - Granulated and agglomerated nutrients
  - Mannitol - EZ-Press™ Mannitol
  - Microencapsulations, including specialized systems for gummies and chews
  - Spray dried nutrients

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ABOUT WATSON

Innovation Leads the Industry Forward

Enhancing Animal Health and Nutrition

Watson was founded in 1939, and today operates three manufacturing facilities located in Connecticut and Illinois.

Watson is one of the highest-quality suppliers of products and services geared towards enhancing health and nutrition. We are a leader in developing quality products and ingredient systems, for both the human and companion animal foods industries.

Expertise in microencapsulation, agglomeration, micronizing, spray drying, and film technology allows us to develop unique formulations and products, using Watson manufactured value-added ingredients.

- Technology that overcomes your greatest challenges
- Enabling you to create the products of the future, fulfill untapped consumer needs, and build new markets
- Fostering trust, transparency, and integrity

Quality is the cornerstone from which we have built our reputation in the industry. Watson has invested in building a robust quality system throughout our organization. All of our employees support our quality programs, and are proud of their role in maintaining our exacting standards. Quality is everyone's highest priority, every day.

CHELATED MINERAL

When selecting pet foods and supplements, many consumers look for supplements that include chelated minerals. This is often viewed as a sign of quality.

Chelation refers to the process during which minerals, such as calcium or selenium, are bound to an amino acid or peptide. The word chelated comes from the root word khele, which is Greek for "claw." The mineral is bound to another substance, making it more readily-absorbed by the body.

Chelates are organic forms of essential trace minerals, such as copper, iron, manganese, and zinc. Both humans and animals absorb, digest, and use mineral chelates better than inorganic minerals. This means better efficacy, and therefore lower concentrations can be used.

There are three main categories of chelates:

1. Chelates are organic molecules that normally consist of 2 organic parts with an essential trace mineral occupying a central position and held in place by covalent bonding.
2. Proteinates are a particular type of chelate in which the mineral is chelated with short-chain peptides and amino acids derived from hydrolyzed soy proteins.
3. Amino-acid complexes, such as glycinates and methionates, are types of chelates in which the mineral is chelated with an amino acid.

In summary: Chelated minerals are thought to be more digestible than the nonchelated forms. In other words, chelation is believed to make the minerals more bioavailable, or able to be absorbed, by shielding them from the effects of other dietary elements in the digestive tract.

Product Line

Boron Chelate 5%	Chromium Chelate
Chromium Chelate 0.6%	Chromium Citrate
Copper	Iron
Magnesium	Magnesium Aspartate
Magnesium Citrate	Manganese
Molybdenum	Molybdenum Citrate
Molybdenum Citrate 0.15%	Proteinates
Selenium	Selenium Chelate
Selenium Chelate 0.35%	Zinc

CUSTOM NUTRIENT PREMIXES

Watson's Custom Nutritional Premixes represent precise combinations of micro- and macro-nutrients specifically designed to suit your pet food or treat. Each nutrient component is pre-scaled and precision blended into a premix. Premixes can be custom packaged to fit your batch size requirements.

More than Just Vitamins and Minerals

Typically, premixes are believed to consist of only vitamins and minerals. At Watson, we custom-formulate a premix to include such functional ingredients as fibers, gums, amino acids, proteins, and botanicals.

Watson maintains a comprehensive range of raw materials. Watson's purchasing department are experts in the sourcing of raw materials and supplier qualification. This expertise and flexibility allows Watson to respond successfully to a wide range of customer needs. At Watson, we understand that, by including other nutrients in Custom Premixes, we can save our customers time and money. Our goal is to formulate products that are optimized for each customer, so that maximum benefits can be derived from combining multiple ingredients into a single blend.

Our research and development team members have a diverse background and a range of industry experience. They are positioned to be a valuable resource to advise our customers in the use of ingredients such as fibers, gums, amino acids, proteins, and botanicals, as well as vitamins and minerals.

Our in-house capabilities allow us to microencapsulate botanicals, for example, as well as vitamins. This can be useful in masking off-flavors or odors. We can also spray-dry oils and liquids to produce free-flowing powers, which can also be incorporated directly in the premix.

Watson also has the capability to change particle sizes. We can grind and micronize to decrease particle size, and we can also agglomerate or granulate to increase size. These capabilities allow us to include a wider range of ingredients in a Custom Premix without risk of separation or loss of homogeneity.

Watson provides a complete Certificate of Analysis, which can include fiber or protein assays, as well as micro-nutrients.

In addition to dry blending, Watson also produces custom oil blends.

DRUM-TO-HOPPER BLENDS

Designed for the manufacture of animal dietary supplements

Complete blends of active ingredients, binders, and excipients such as fillers, disintegrants, and lubricants for the manufacture of high-quality tablets. There is no need to preprocess Watson's drum-to-hopper blends before manufacture of the finished tablets.

The Benefits of Watson Drum-to-Hopper Blends:

- **Reduced Production Cost:** By providing a ready to use drum-to-hopper blend, Watson can reduce your labor costs substantially by eliminating preprocessing in your facility. This frees up your equipment, prevents production delays and reduces labor and equipment running costs.
- **Quality Assurance:** By providing a complete Certificate of Analysis with every lot shipped, Watson can reduce your in-house quality control process. Pre-shipment samples can also be arranged, at customer request.
- **Large Lot Sizes:** By manufacturing in lot sizes up to 10,000 lbs., Watson can provide you with a minimal number of lots. Lot-to-lot variability is strictly controlled.
- **Excellent Compression Profile:** Drum-to-hopper blends provide good tablet-hardness and low friability, ideal for smaller sizes.
- **Physical Specifications:** Watson's strict physical specifications ensure uniform particle-size distribution, good flowability, and high bulk density.

EDIBLE GLITTER™

Edible Glitter™ flakes are toppings, inclusions, and color change systems. Pure sparkle and magic, they can be used in a wide range of applications and there are several different varieties available, depending on your application.

You can add glitter to:

- Soft and baked pet treats, for visual appeal
- Dry dog foods
- Wet dog food as a topping

Properties

- Heat Stable: Glitter can be baked on without browning or burning in temperatures up to 450º F.
- Freeze/Thaw Stable: Use it on frozen desserts and frozen baked goods.
- Available Solubility Options: Soluble and insoluble forms.
- Flake Size: Available in a range of flake sizes
- Colors: FD&C, non-FD&C, EU, and custom Pantone colors available

Types of Edible Glitter

In most applications, "soluble" edible glitter made from gum arabic is the preferred choice, and it can be used on baked, fried, and frosted products; however. Some applications, however, require a glitter product with a slower solubility rate. Watson manufactures edible glitter with various solubility rates that are ideal for use in high active water systems.

Beyond Color:

Flavored Edible Glitter™ can be added as a topping when pet food is served. This allows for flavor changes and variety. The involvement of the pet parent in the preparation and flavoring of the food builds the bond between the person and the pet. A variety of flavors such as cheese, beef, chicken, liver, and milk are available.

Beneficial ingredients such as chlorophyll can be added to Edible Glitter for breath-freshening.

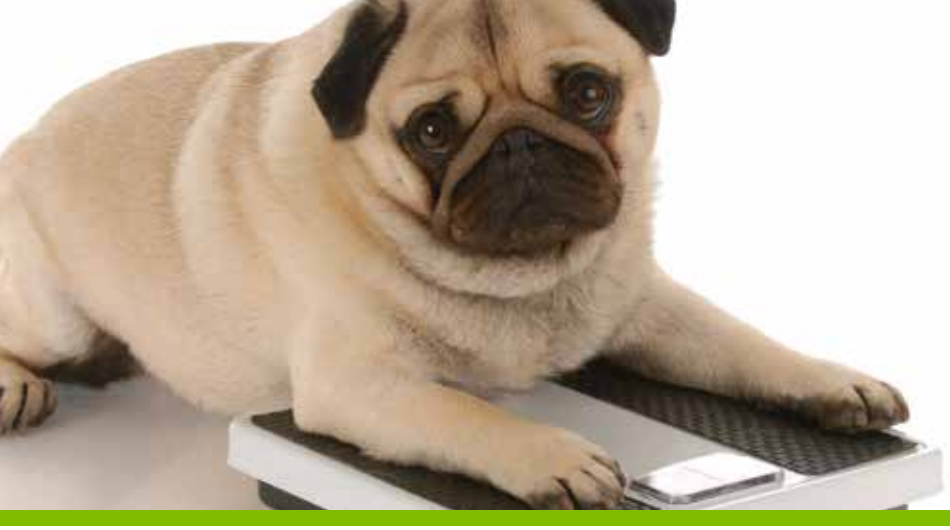
EDIBLE FILMS

- Pet Breath Fresheners
- Pet Oral Hygiene or Dental Care Strips
- Low Calorie Training Treats - Strips
- Vitamin and Nutritional Strips

Customized for Your Product Image

- Flavor: Any flavor can be added, such as beef, chicken, liver, or cheese
- Color: A full range of colors is available, including FD&C colors, Non-FD&C colors, EU colors, and custom Pantone-matched colors.
- Appearance: Films can be imprinted on using edible inks.
- Size: Film is produced on a mill roll; it can be slit to various widths and cut into any size.
- Solubility: Most film strips made today are fast dissolving. Solubility can be controlled to provide fast or slow dissolution. Slow dissolution may be beneficial for some applications.
- Thickness: The thickness can be varied to control dissolution rate, as well as to allow for more active ingredients to be incorporated. Standard thickness is typically 1.5 mils (0.0015 inches, 0.03 mm), however thickness up to 6 mils (0.006 inches, 0.15 mm) are possible however.

Active ingredients can be incorporated directly into the solution prior to the film being cast. These active ingredients, which can comprise up to 25% of the film by weight, become locked into the film matrix and remain stable until consumption. Examples of actives used in film strips include ingredients for oral care, nutrients, or botanicals.



FIBERS – BRANS AND GERMS

Why is Perfect Grain™ so perfect?

Perfect Grain™ is a wheat germ and wheat bran blend which has been micronized so fine that it is indiscernible from flour.

Perfect for use in baked pet treats and dry foods.

The average particle size is under 5 microns. That's important because your pet's teeth can detect particles over 5 microns. Your pet's tongue can detect particles 30 microns and larger. We use a unique process to micronize Perfect Grain™ and the result is an average particle size of about 1.5 microns ... well below the size that can be detected by your teeth or tongue!

Product Line:

- Combined micronized wheat bran and germ
- Micronized germ from wheat
- Micronized bran from corn, wheat, or rice

Nutritional Benefits:

- Fiber
- Nutrients inherent in bran and germ

Benefits of Fiber in Pet Foods:

- Fiber can promote weight loss.
- Fiber is a stool normalizer, and helps to promote healthy bowel movements in pets.
- Fiber may reduce the risk of colon cancer.

GRANULATED AND AGGLOMERATED NUTRIENTS

Watson's directly compressible nutrients are pre-granulated or agglomerated using a variety of binders. The result is a free-flowing granular powder that is directly compressible for use in nutritional supplements. All Watson agglomerations, granulations, and drum-to-hopper blends are available in starch-free formulations for use in dietary supplements with special labeling requirements.

The Benefits of Watson's Agglomerations & Granulations For Direct Compression

Designed for Tableting

At Watson, we know the issues that are critical to tableting. Consistency in physical properties, such as flowability, particle size distribution, and compression profile, are critical when selecting your directly compressible vitamins, minerals, botanicals, and herbals. That is why we have developed a line of nutrients especially for you, to assure minimal losses, higher productivity, minimal handling, more stable tablets, the highest bulk density, versatility in formulation, high carrying capacity, and guaranteed potency.

All our directly compressible products are put through a rigorous physical evaluation for bulk density, flowability, compression profile, and particle size. Trial tablets are made and tested for hardness, dissolution, and friability. A complete analytical evaluation of each product is also performed to guarantee potency. Each lot is accompanied by a complete Certificate of Analysis from our analytical laboratory, located in our corporate headquarters in West Haven, Connecticut.

Toll Manufacturing:

Do you have an active or raw material you would like made directly compressible? Watson provides toll manufacturing services. Work with our research and development team to define your project. You provide the active or raw material, and we can create the value-added product in the particle-size range you are looking for.

MANNITOL – DIRECTLY COMPRESSIBLE

Name of sweetener	Mannitol
Calories per gram	1.6
Sweetness index (compared to sucrose which is 1 on the scale)	0.5
Glycemic Index	2

Description	EZ-Press™ Mannitol DC is a free flowing white powder
Mean Particle Size	270 Microns
Bulk Density	0.48 g/cc
Moisture	0.5%
Tapped Bulk Density	0.59 g/cc
Carr's Index	18.6
Hausner Ratio	1.23

Watson's EZ-Press™ Mannitol DC was formulated for direct-compression tableting and has good compressibility. Applications include a direct-compression diluent for tablets, capsules, and effervescent tablets. Tablets have good hardness, low friability, and rapid dissolution. Tablets also have good hardness and have and desirable organoleptic qualities for chewable tablets.

Benefits of Mannitol as a sweetener:

- Taste: good flavor
- Aftertaste: Little or none
- Slow solubility and pleasant creamy mouthfeel make Mannitol an excellent choice for chewable tablets.
- Very low Glycemic Index (GI) of 2 compared to Sucrose, which is the standard with a GI of 65.
- Low GI may make Mannitol suitable for a diabetic diet.
- As with all sugar alcohols, Mannitol is not metabolized in the oral cavity and therefore will not contribute toward tooth decay.
- Mannitol is non-hygroscopic, and will not absorb moisture from the atmosphere. This makes it a good choice for use with moisture-sensitive actives.
- Mannitol can increase the rate of tablet distegration.
- Unlike Xylitol, Mannitol is not toxic to dogs and is often used in veterinary medicine.

MICROENCAPSULATION

What is Microencapsulation Technology?

Microencapsulation is a process by which we apply a protective coating called a matrix around a small particle called the core or active. The matrix keeps an active ingredient locked in and stabilized until the release of the material is desired.

- People might encapsulate in order to mask a bitter or unpleasant taste.
- An ingredient could be encapsulated in order to provide a barrier from other ingredients.
- An ingredient might be encapsulated to provide a specific temperature release (as in a baking application), a pH release, or a sustained or otherwise modified release.

Microencapsulation Applications and Benefits:

There are many benefits to the food or supplement manufacturer that can be achieved through encapsulation. Knowing when to use microencapsulation and when it is not needed will make the difference in keeping price points low while ensuring strong consumer appeal.

1. **Reduce Overages:** To ensure label claim is met, often higher levels or "overages" must be added to compensate for expected losses in nutrient potency that occur during processing. Given the high costs of many vitamins, these overages can eat into your profit margins over time. Encapsulation protects these nutrients, reducing losses and minimizing overages. The result is significant cost savings.
2. **Protection:** From moisture, acids, ingredient interactions, heat, and exposure to oxygen.
3. **Release Parameters:** Engineered so that the nutrient is released when desired, for instance at a specified temperature or in the stomach for digestion.
4. **Flavor and Odor Masking:** Increase consumer acceptance by minimizing unpleasant tastes and odors associated with certain nutrients.
5. **Ease of Handling:** Encapsulated ingredients are dry and free-flowing.
6. **Precision:** The stability afforded by encapsulated ingredients allows measuring and delivery of precise levels of the desired nutrient.
7. **Effectiveness:** Encapsulation is critical to such products as medical foods, nutraceuticals, and meal-replacement products,

where characteristics such as stability, bioavailability, delivery, and effectiveness are closely regulated.

Different Microencapsulation Methods

1. Hot Melt Microencapsulation Process
2. Aqueous Coating Microencapsulation Techniques
3. Solvent Coating Microencapsulation Technology

Hot Melt encapsulation

In the fluid bed microencapsulation process, atomizing air breaks a molten solid into droplets, which hit the substrate particle and spread on the surface of that particle. The droplets are applied layer by layer until they coalesce into one integral film.

One of the important parameters is the selection of the coating material. At what temperature do you want it to melt? What is the application? Are there any GMO restrictions or other requirements on it? All of these things need to be considered when selecting the coating material.

Aqueous Coating Microencapsulation Techniques

Microencapsulation with a water soluble (aqueous) coating material can be done using top spray fluid bed coating methods.

You might want to encapsulate a hygroscopic ingredient but not affect its release characteristic greatly. By encapsulating (or agglomerating) with a water soluble material, we can reduce the substrate's hygroscopicity, while not greatly impacting its release rate. Sometimes an ingredient is coated to change the color or appearance, to make it shinier for example.

Aqueous coatings are often used as a prefill for particles with a lot of surface irregularity that need to be smoothed before another coating is applied.

Solvent Coating Microencapsulation Technology

Solvent coating is another fluid bed process used to apply a water-insoluble coating (such as ethylcellulose dissolved in alcohol) onto a particle substrate.

Solvent coatings are often used when the substrate is incompatible with water, or extremely fine. Encapsulation applications for solvent coatings:

- Gummy vitamins
- To protect sensitive ingredients incompatible with certain pH ranges
- To protect sensitive ingredients incompatible with extreme heat.

Choline is of particular interest for cat food manufacturers and is available from Watson in several microencapsulated forms.

NATURAL MOLD INHIBITORS

Simple Sells – Clean Label Consumer Insights

What is Clean Label?

There is really no firm definition on the meaning of 'clean label.' Generally when consumers say they want clean label products, they are looking for products with ingredient statements that are short and simple. They are looking for words that are familiar to them and that they associate with ingredients they would find in their own kitchens. Sometimes advertisements for clean label products illustrate that an ingredient statement should be so simple that a young child can read it easily.

Seizing the Market Opportunity

The consumer demand for clean label ingredients has opened a door of opportunity. Consumers are looking for products they feel are safe and free of chemical sounding ingredients and products that they can trust. Moreover they still expect the same level of quality, flavor, and shelf life, but with friendly-sounding ingredients. This presents a challenge to the industry, but also a great opportunity for those who can reformulate to address these needs. At Watson, we believe that you can produce high quality, great tasting pet foods and treats with an extended shelf life and ingredients that are very consumer-friendly.

No Mold™ 20: A natural, free-flowing mold inhibitor made from fermented whey. It inhibits mold growth in yeast-raised products without affecting yeast growth.

Long Life Parve™: An all-natural mold inhibitor for yeast-raised products based on cultured sugar syrup, for kosher parve declaration.

SPRAY DRIED INGREDIENTS

Watson produces a full line of industry-standard spray dried ingredients. We also feel strongly that customized approaches can often yield the best performance in the end product. For this reason, roughly half of the spray dried products we manufacture are custom products and made for a singular product application.

What is Spray Drying Microencapsulation?

Spray drying for microencapsulation is very different than fluidize bed processes. In spray drying for encapsulation, we change a liquid into a powder form. The process starts with an emulsion or dispersion.

Unlike the fluidize bed methods, spray drying does not produce a full microencapsulation; we are not building a shell or matrix on the outside of the particle. Instead, in the spray drying process, we are creating a dispersion or emulsion of an ingredient within another ingredient, and then drying this emulsion very quickly. On the outside surfaces of the resulting dry particles, there will always be some of the active component or active ingredient. The inside core is much more protected. Examples for spray drying applications include the fat soluble vitamins, such as vitamin A, vitamin D, and vitamin E. When spray dried, these vitamins are much more stable for shelf life, however there will always be some amount of surface oil.

Key points of difference in the process of spray drying for encapsulation:

- Spray drying process turns liquids into powders
- Spray drying starts with an emulsion or dispersion
- Spray dried materials are not fully encapsulated

Examples of spray drying for encapsulation:

- Fat soluble vitamins
- Healthy lipids

Benefits of spray drying for encapsulation:

- Results in free-flowing powers
- Stabilizes for increased shelf life

TRITURATIONS

Trituration is the process by which a micronutrient is standardized on a carrier for better distribution in the final blend, ease of scaling, and homogeneity. Watson utilizes a specialized blending technique to homogeneously distribute a potent micronutrient throughout a carrier.

The resulting trituration can be customized to any level of active-to-carrier ratio or percentage, by blending the micronutrient on a carrier such as di-calcium phosphate, maltodextrin or microcrystalline cellulose, among others. By eliminating the need to scale off pure micronutrients in small quantities, correct dosage is assured and costly errors prevented. Scaling waste of costly pure micronutrients is minimized.

Most importantly, triturations provide homogeneous dispersion of the micronutrients in your finished blend or product. Watson utilizes a wide range of carriers to suit the properties of your finished product, taking into consideration desired characteristics such as solubility, particle size or special label claims, as in the case of starch-free products.

Applications

- Dietary Supplements (Multi-vitamin/mineral tablets or capsules)
- Food Fortification

Our line of triturations include both standard and customized products, such as:

- Biotin 1%
- Biotin 1%, 5% on DCP
- Chromium Chloride 1%, 2%, 10%
- Chromium Citrate 2%
- Folic Acid 10% on DCP
- Folic Acid 10% on Maltodextrin
- Nickelous Sulfate 1% (Nickel)
- Potassium Iodide 1%, 5%
- Sodium Metasilicate 1% (Silicon)
- Sodium Metavanadate 1% (Vanadium)
- Sodium Molybdate 1% (Molybdenum) (F080002)
- Sodium Selenate 1% (Selenium)
- Sodium Selenite 1% (Selenium)
- Stannous Chloride 1% (Tin)
- Trace Mineral Premix Trituration for Advanced & Senior Formulas
- Vitamin B12 0.1%, 1%, 5%



QUALITY & REGULATORY

In-House Quality Control Laboratory

High quality control standards are supported by Watson's state-of-the art analytical laboratory.

- The quality control group is led by a Ph.D. with a staff of ten B.S., M.S. or Ph.D. degreed scientists.
- Mineral and trace elemental analyses are supported by two ICP emission spectrometers and an ICP mass spectrometer.
- Vitamin, supplement, and other active ingredient analyses are supported by eight HPLC systems, two UV spectrophotometers, a dual beam IR spectrometer FTIR and NIR.
- A wide variety of specialized instrumentation also includes ion electrometers, particle size classification, programmable viscometry, auto-titration, and microscopy, which are extensively employed in the quality control process.
- Our wide variety of specialized instrumentation also includes ion electrometers, particle size classification, programmable viscometry, auto-titration, and microscopy, which are extensively employed in the quality control process.

Upon request, Watson scientists will work with a customer's laboratories to help develop their own in-house test methods.

GFSI Certified

Watson Inc. is BRC certified and earned an "A" rating.

BRC is GFSI certification Standard. BRC certification is central to Watson's quality incentives and customer focus programs.

The Global Food Safety Initiative (GFSI) is a project led by the business forum CIES to harmonize international food safety standards and reduce the need for multiple supplier audits. The CIES members include the leading retailer organizations and food manufacturers.

Other Certifications

- **Organic** – audited annually Global Organic Alliance (GOA)
- **Gluten-Free** – audited annually Gluten Free Certifying Organization, Gluten Intolerance Group (GFCO/GIG)
- **Kosher** – Circle U Orthodox Union
- **Halal** – Islamic Food and Nutrition Council of America (IFANCA) – by request.



OUR FACILITIES

Watson Inc. is a third generation family-run business, founded in 1939. Our headquarters is located in West Haven, Connecticut. Our two modern 55,000 and 95,000 sq. ft. Connecticut facilities house our R&D, manufacturing, and analytical departments. We have an 80,000 sq. ft. manufacturing and distribution center in Taylorville, Illinois. We also have distribution warehouses in several international locations.

Facilities Feature

- Hepa Filtration
- Humidity/Temperature Controlled Rooms
- Pilot Labs

Equipment List Includes

- Blenders from 1 kg to 5,000 kg
- Fluid Bed Coaters
- Edible Film Lines
- Fitzmills
- Micronizing Bead Mills
- Quick Sieve
- Co-Mill
- Pin Mills
- Jacketed Liquefiers
- Homogenizers
- Sifters
- Double Drum Dryers
- Mix Tanks

Evaluation Equipment Includes

- Mesh Size Analyzers
- Bulk Density Testers
- Coating Integrity Evaluators
- Tablet Presses
- Hardness Testers
- Moisture Analyzers

Analytical Instrumentation Includes

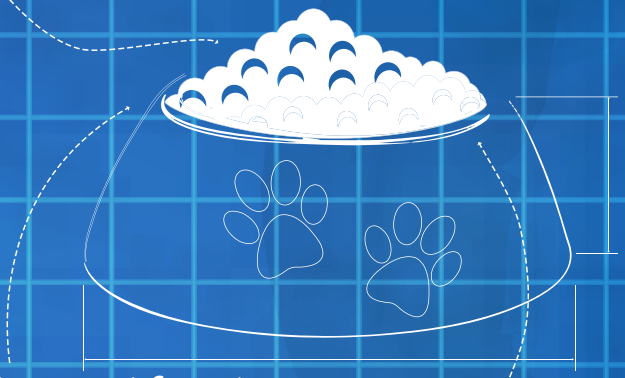
HPLC, ICP, MS, NIR, FTIR, Colorimetry, UV Vis

Quality Systems

- Trained HACCP & BRC Teams

BRC FOOD CERTIFICATED

Dog/Cat Food



Foods that nurture the bond between human and pet

Nutritional formulations for puppies, adolescent, adults, seniors and performance athletes

Innovative foods and feeding methods

Formula:
- ✓ Ingredient A
- ✓ Ingredient B
- ✓ Ingredient C

Promote health and long life, prevent illness and medical conditions such as bloat

Dog/Cat Treat

Re-invent the treat

Low calorie options

Promote dental health, activity, mental focus and play

Calm and reduce anxiety

Watson

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