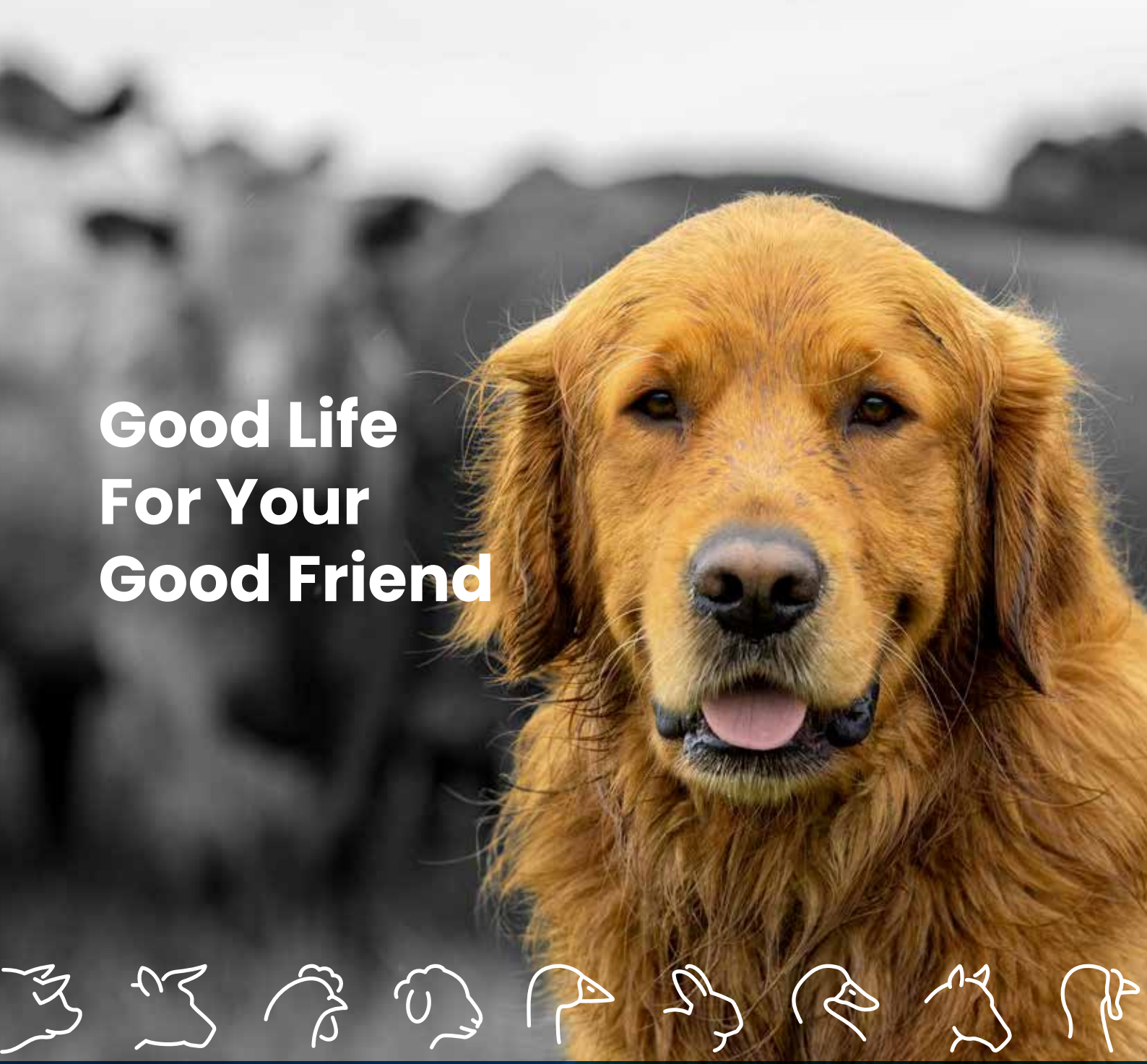


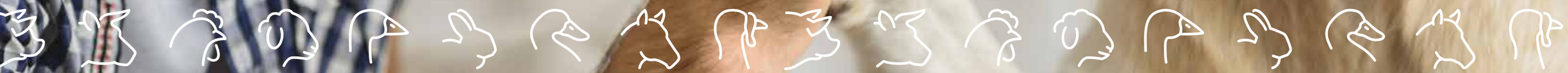
friulchem spa www.friulchem.com

FC FRANCE SAS www.fc-france.com

FRIULCHEM

is a Contract Development and Manufacturing Organization (CDMO) dedicated to Animal Health: Friulchem integrates product development with full-scale manufacturing through a Quality by Design-based process. Friulchem is your single-source partner for successful product approval, commercialization, and ongoing supply. Our firm is a reference point for the VET market, a company able to offer cutting-edge solutions in the pharma and supplements field and the field of additives, highlighting its ability to bring products of the highest quality made in Italy.

Their health, our care



www.friulchem.com

25 Years

Our research

Friulchem is a company with over twenty-five years' experience. A private company focusing on research, development, and production of pharmaceuticals for human and veterinary use. Friulchem is also an innovative SME.
Our development staff and quality-based processes offer timely support for the launch of new products that improve the lives of animals.

Our equipment and services

Our experience in the industry and project management resources ensure successful technical transfer, process validation, scale-up, and troubleshooting.

Contract Manufacturing

Our diversified production capabilities are entirely dedicated to animal health products. In addition to the site in Italy, Friulchem has expanded its range with its plant in France. FC France is a CDMO specialized in developing, manufacturing, and packaging veterinary products.

Laboratory

Our fully equipped research and development laboratory has been awarded as one of the high-value laboratories of our Region, Friuli Venezia Giulia (Italy), and offers external services to third companies. It is staffed with experienced personnel and state-of-the-art equipment that supports method development, product validation, and ongoing product quality.

Technologies & Services

Key Technology Platforms

Friulchem has several proprietary drug delivery technologies at its disposal. Friulchem adapts these technologies to support our partners in their product development to design the ideal product.

FC Micronization Technology

At Friulchem, we employ a jet mill micronizer. We ensure the homogeneity of particle sizes and stability in our products by using only high-purity nitrogen, providing perfect preservation during the micronization process.

What is Micronization?

Micronization is the process of reducing the particle size of a powder to a microscopic scale. This process enhances the distribution and solubility of the active ingredient in drugs. Using liquid nitrogen to achieve optimal results.

Advantages of Micronization

Increases solubility: Smaller particles dissolve more rapidly in the body, allowing greater drug efficacy.
Improves bioavailability: Micronized particles are more readily absorbed by the gastrointestinal tract, enhancing therapeutic effectiveness. Enhances stability: By reducing the exposed surface, micronization can improve the stability of the active ingredient. Reduces dosage: Micronized drugs require lower doses to achieve the same effects, potentially reducing side effects.

Quality Standards

Rigorous quality standards are adopted during the process to ensure the purity and stability of the active ingredient. Granulometric, chemical, and microbiological analyses are conducted to ensure compliance with pharmaceutical requirements. Compliance with veterinary industry regulations and guidelines (GMP).

Plus

Micronization

with nitrogen is an essential process for enhancing the efficacy and quality of the APIs.

Method

this method enables better solubility, bioavailability, and stability of Active Pharmaceutical Ingredient .

FC Blending Technology

At Friulchem, we use bins of different capacities to blend different APIs alone or with excipients. This choice allows for perfect containment of the powders. We have added a Glove Box line to blend and package hygroscopic products.

Importance of Blending

Blending is essential to ensure a uniform distribution of active ingredients in veterinary medicines. Homogeneous distribution improves therapeutic efficacy and reduces the risk of overdosing or underdosing in animals. Choosing the proper excipients also contributes to product stability and optimization of the administration route.

Blending Process

Preparation of active ingredients and excipients involves controlling the quality of raw materials and accurately weighing them according to the specific drug formula.
Blending of substances in a tumbler mixer.
Control of blending duration and conditions to ensure uniformity.
Quality control of blends obtained through chemical and microbiological analyses.

Quality Standards

The quality of blends is evaluated through tests for uniformity, homogeneity, and granulometry on representative samples to ensure specific requirements are met.

Plus

Blending

allows for the combination of multiple active ingredients and excipients.

The process

aims to create optimal pharmaceutical formulations.

Key benefits

include enhanced stability, solubility, and bioavailability.

Blending

can improve physical homogeneity.

It helps

in reducing the segregation of formulation components.

FC Granulation Technology

We have developed a unique granulating and coating technology that protects APIs from mechanical stress while preparing premixes and fragile compounds such as microorganisms, enzymes, yeasts & bacteria.

Importance of Granulation

Granulation is crucial for improving the manageability of the active ingredient facilitating the production of premixes, tablets, or capsules. It helps achieve a uniform distribution of the active ingredient in the final product and reduces dustiness. Choosing suitable excipients can influence the drug's solubility, storability, and therapeutic efficacy.

Granulation Process

Preparation of active ingredients and excipients, including grinding and weighing raw materials.
Mixing of raw materials according to the specific drug formula.
Addition of liquids (solutions or suspensions) to form a granular mass.
Granulation using a granulating machine.
Drying of granules to remove excess moisture.
Sieving with a calibrated sieve for dimensional uniformity.
Analytical control of obtained granules.

Quality Standards

Granules undergo rigorous quality analyses, including granule size and density measurement, to ensure compliance with specific requirements.

Plus

Granulation

An essential phase in the production of veterinary drugs.

Improves Manageability

Granulation enhances the handling of components during the manufacturing process.

Uniform Distribution

Ensures that active ingredients are evenly distributed in the final products.

Effectiveness of Active Ingredients

Granulation boosts the efficacy of the APIs in the final products.

FC Spray Drying Technology

Friulchem is one of the few companies operating this technology dedicated to animal health. Spray drying produces a dry powder from a liquid or slurry by rapidly drying with hot gas. This is the preferred method for drying many thermally sensitive materials like pharmaceuticals.

Importance of Spray Drying

Spray drying is crucial for converting liquid substances into fine powders, increasing the stability and storability of the active ingredient. This technique allows formulations suitable for tablets, capsules, liquids, or other administration methods. It is beneficial for active ingredients sensitive to heat or light.

Advantages of Spray Drying Process

Improves stability: Removing moisture from the solution prevents degradation of the active ingredient.
Facilitates administration: The solid form is more accessible to dose and administer to animal patients.
Increases storability: Solid forms are less prone to microbiological contamination and oxidation.
Reduces volume and weight: Powder or granules occupy less storage space than liquid solutions.

Spray Drying Process

Preparation of the liquid solution containing the active ingredient and excipients.
Feeding the solution into an atomization chamber inside the spray drying device.
Atomization of the solution into small droplets using a high-pressure nozzle. Rapid drying of droplets in a drying chamber using hot airflow.
Collection of the final product, now in powder form.

Quality Standards

Powders obtained from spray drying undergo rigorous quality analyses, including measurement, solubility, and stability.

Plus

Spray drying
is a crucial phase in the production of veterinary drugs.

Trasformation
It transforms liquid solutions into solid forms.

Improves
the stability and storage of the active ingredient.

Packaging Line for Sachets

Products in powder or granulated form can be packed in sachets from 40g to 1,000g for feed products and from 100g to 1,000g for pharmaceutical products. Thanks to a particular system that draws air from the product, Friulchem can package voluminous products, thus increasing specific weight.

Importance of Packaging

Packaging is crucial to ensure accurate and safe administration of veterinary drugs. Active ingredients in powder or granule form require special packaging to preserve them from moisture and contamination. Individual sachets offer precise dosage and excellent storability.

Advantages of the Packaging Process

Improves storability: Air suction prevents oxidation and degradation of the active ingredient.
Preserve efficacy: Its therapeutic effectiveness is ensured by shielding the drug from moisture and contamination.
Dosage customization: The system allows packaging sachets with different product quantities to meet specific needs.

Packaging Materials

Sachets: Made from air-tight materials such as aluminum or plastic to maintain product quality according to the customer's needs. Hermetic sealing system: Thermally sealing the sachets to prevent air ingress.

Packaging Process

Step 1: Feeding the active ingredient in powder or granular form into the packaging system.
Step 2: Accurate dosing of the product into the pouch, with the possibility of varying the quantity from 40g to 1,000g for feed products and from 100g to 1,000g for pharmaceutical products.
Step 3: Thermally seal the sachet on all four sides.

Quality Standards

The packaging process requires checking for air tightness and hermetic sealing. Each pouch must undergo quality checks to ensure product integrity and shelf life.

Plus

Packaging

A critical phase in the production of veterinary medicines.

Friulchem Feed Department & Services

Friulchem decided to invest in the production of feed supplements and complementary feed to complete our offer.

In the following years, the activity was strongly focused on the production of complementary feeds and premixes for the livestock sector and the pet-food industry.

Based on our proprietary technologies, Friulchem is able to implement any formulation for integrating the feed, even on technical specification required by the end user, be it a feed mill or a farm. Friulchem offers custom formulations designed to make farmers use products grown in their companies.

Pharma Department

Granulation

Production capacity

300.000 Kg/year

- Bulk Packaging
  > 5 -10-20 Kg
- Packaging in Pre-Formed Bags From 100g to 20 Kg
  > 1.000.000 Sachets/Year
- Packaging In Bags (In-Line) From 100g To 1 Kg
  > 1.000.000 Sachets/Year
- Packaging In Jars From 100g To 5 Kg
  > 1.000.000 Sachets/Year

Micronization

Production capacity

300.000 Kg/year

- Bulk Packaging > 5 -10-20 Kg

Blending

Production capacity

1.000.000 Kg/year

- Bulk Packaging
  > 5 -10-20 Kg
- Packaging in Pre-Formed Bags From 100g to 5 Kg
  > 1.000.000 Sachets/Year
- Packaging In Bags (In-Line) From 100g To 1 Kg
  > 1.000.000 Sachets/Year
- Packaging In Jars From 100g To 5 Kg
  > 1.000.000 jars/year

Pre-Mixes

Production capacity

1.000.000 Kg/year

- Bulk Packaging > 25 Kg

Spray Dryer

Production capacity

30.000 Kg/year

- Bulk Packaging > 5 -10-20 Kg

Feed Department

Effervescent Granules

Production capacity

300.000 Kg/year

- Packaging in Pre-Formed Bags from 100g to 20 kg
  > 1.000.000 sachets/year
- Packaging in Bags (in-line) from 100g to 1 kg
  > 1.000.000 Sachets/Year
- Packaging in Jars from 100g to 5 kg
  > 1.000.000 jars/year

Tablets

Production capacity

30.000 Kg/year

- Tablets Of 0,55 gr
  > 60.000.000 tablets/year
- Tablets Of 1,10 gr
  > 30.000.000 tablets/year
- Tablets Of 2,20 gr
  > 15.000.000 tablets/year

- Packaging in Jars Of 30 – 60 – 90 Tablets
- Packaging in Blisters of 10 – 15 Tablets

Pre-Mixes

Production capacity

1.000.000 Kg/year

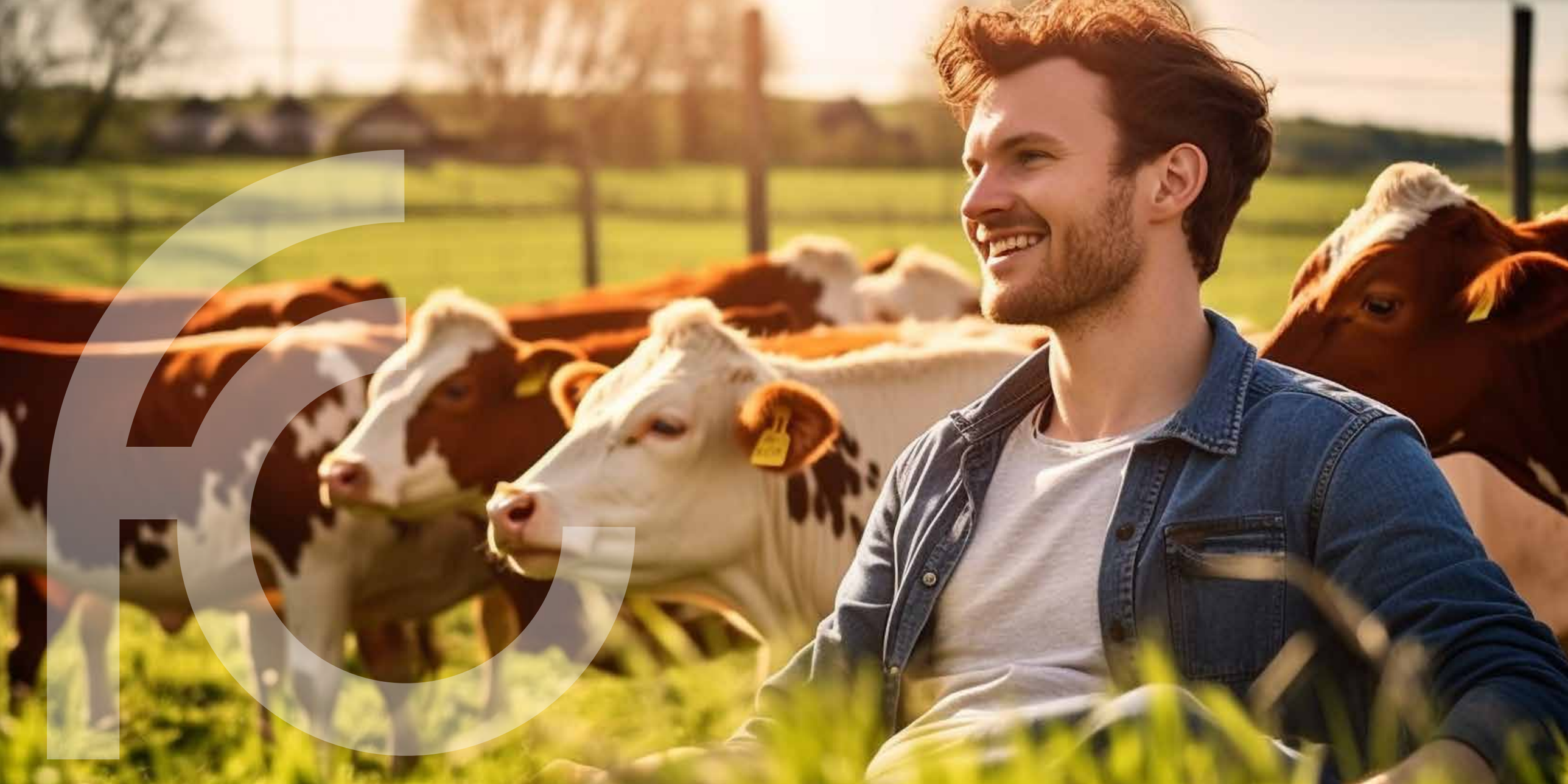
- Bags Packaging > 25 Kg

Spray Dryer

Production capacity

30.000 Kg/year

- Bulk Packaging > 25 Kg



FC FRANCE SAS

FC France is a CDMO specialized in developing, manufacturing, and packaging veterinary products.

FC France

Oral and soluble powder (POS)

Animal health Oral and soluble powder manufacturing combines pharmaceutical and nutritional expertise to create high-quality products. Our specialists choose the best raw materials, vitamins, minerals, plant extracts, and other essential nutrients to ensure the safety and effectiveness of the final product. Once the active substances are selected, according to the product formulation, they are meticulously mixed to create a fine powder that allows uniform distribution of nutrients and optimal absorption by the animal.
Each batch of powder is subject to strict and rigorous quality control. Only compliant products are packaged in different packaging according to our customer's requests and then stored in an air-conditioned store until dispatch.

Medicated premix (PM)

Premixed veterinary products consist of active mixtures and inert ingredients to be added to animal feed. There are two types of premixed veterinary products:

• Medicated products and non-medicated food supplements.

The manufacturing process for FC France, veterinary products in premix, is as follows:

• The active and inert substances are weighed and mixed according to the product formulation.
• The premixes are packaged in bags of 5 to 25 kilos, depending on our customer's requests, and then stored in an air-conditioned store until dispatch.
• Veterinary products in premix packaging have many advantages, including effectiveness, comfort, and cost.
• Premixed products can be used to improve animals' health and well-being and increase their productivity.

FC FRANCE SAS

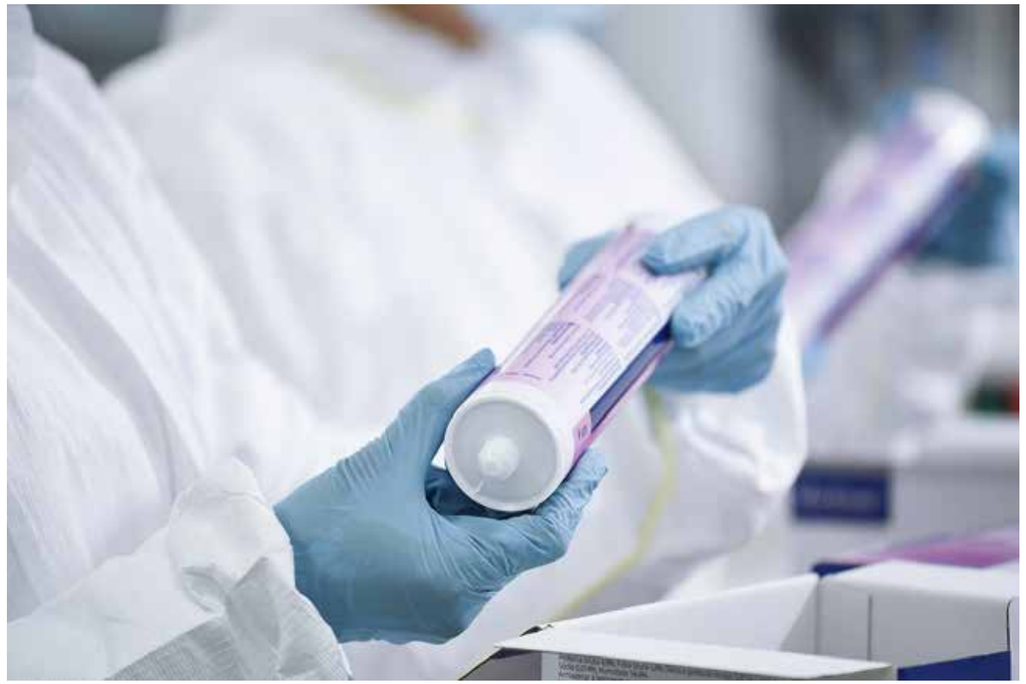
Liquid (solution/suspension)

Liquid veterinary products can be packaged in various formats, from 50 ml bottles to bulk.
The manufacturing process of liquid veterinary products is as follows:

- The active and inert substances are weighed and mixed according to the product formulation.
- The mixture of ingredients is homogenized to obtain a uniform solution.
- The most common formats are 50 ml, 100 ml, 250 ml, 500 ml, 1 liter, 5 liter, and 20 liter bottles, up to bulk.
- The products are packaged according to our customer's requests and stored in an air-conditioned store until dispatch.
- Liquid veterinary products are easier to administer, more effective, and cheaper than their powder equivalent.
- Liquid veterinary products can be used to improve animals' health and increase their productivity.

Paste

Among the most common packaging formats, those in paste form tubes offer a practical solution with precise measurement for administering animal health products.
Our experts choose superior-quality raw materials for their efficiency and safety.
Formulations are then precisely crafted to provide maximum nutritional value and/or to address specific health concerns. Mixing and transforming the ingredients into a homogeneous paste are essential manufacturing steps. The dough is packaged in tubes and stored in an air-conditioned store until shipment. Medicated products and non-medicated food supplements intended for animal health packaged in tubes are a practical and reliable choice for the well-being of our companions.



Secondary packaging

FC France can also carry out the for both pharma and feed divisions, where the drug the customer produces is placed. After receiving the products in their primary packaging (in direct contact with the medicine), they are packaged on dedicated lines and stored in an air-conditioned store until dispatch. FC France offers a wide range of secondary packaging corresponding to your needs.

FC FRANCE SAS

Production capacity

Activities

Oral Powder

- Manufacturing equipments
  - 3 mixing tanks
    - 600L, 2000L, 3000L
- Packaging equipments
  - 5 primary packaging equipments
    - 10g to 25kg
    - Packaging: Sachets, bags, pots, buckets

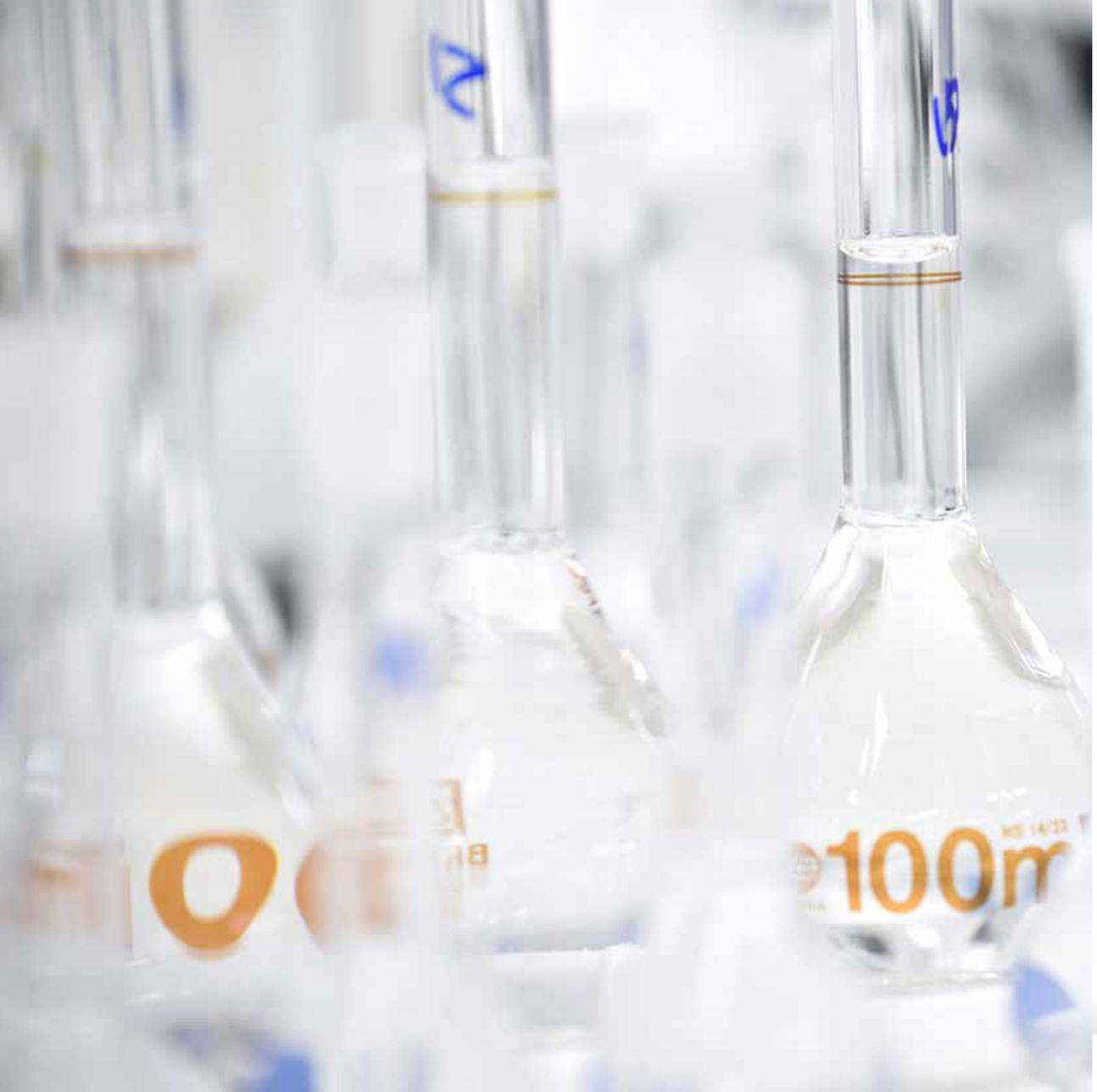
Liquid

- Manufacturing equipments
  - 4 mixing tanks
    - 1500L to 4000L
- Packaging equipments
  - 5 primary packaging equipments
    - Bottles: 50mL to 10L
    - Sticks: 4-8mL

Paste

Non-pharmaceutical dedicated area

- Manufacturing equipments
  - 1 mixing tanks
    - 1000L
- Packaging equipments
  - 1 primary packaging equipment
    - Tubes: 300-400g



Quality Control and R&D Laboratory

Quality control Laboratory is composed by a chemical unit and a microbiological unit. It make strict controls on raw material arrival, during the manufacturing process and on the final product.
Quality control laboratory is equipped with state of the art instrumentation:

Light Scattering Particle Size Analyzer

HPLC – DAD

Millipore Milliflex Filtration System

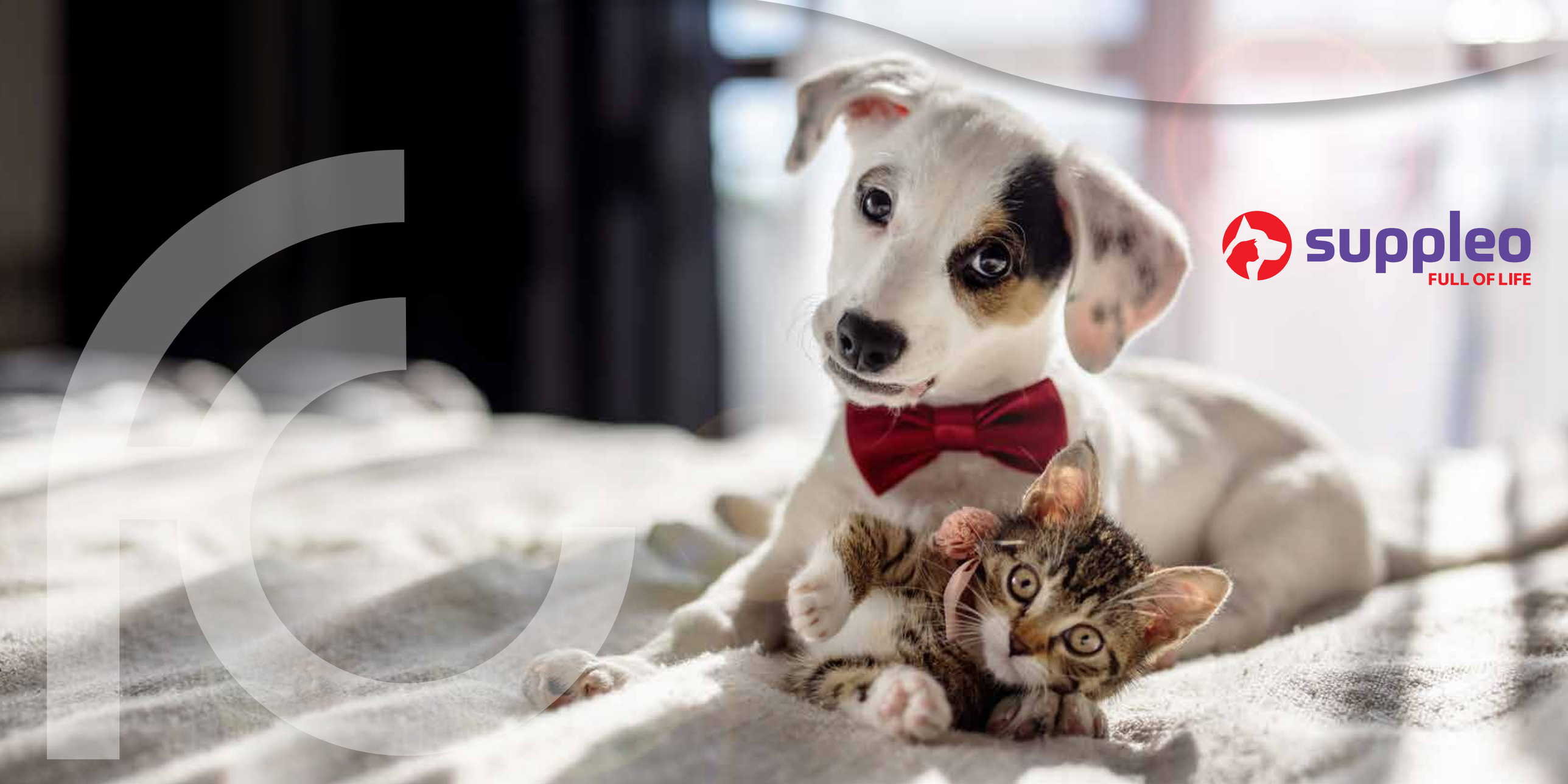
NIR spectrophotometer

Karl Fischer Titrator

TOC Analyzer

In addition quality control Laboratory renders:

- validation of manufacturing process and DMF;
- developing and validation of chemical analytical methods, chemical-physical and microbiological.


suppleo
FULL OF LIFE

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25 Years

Experience and collaboration

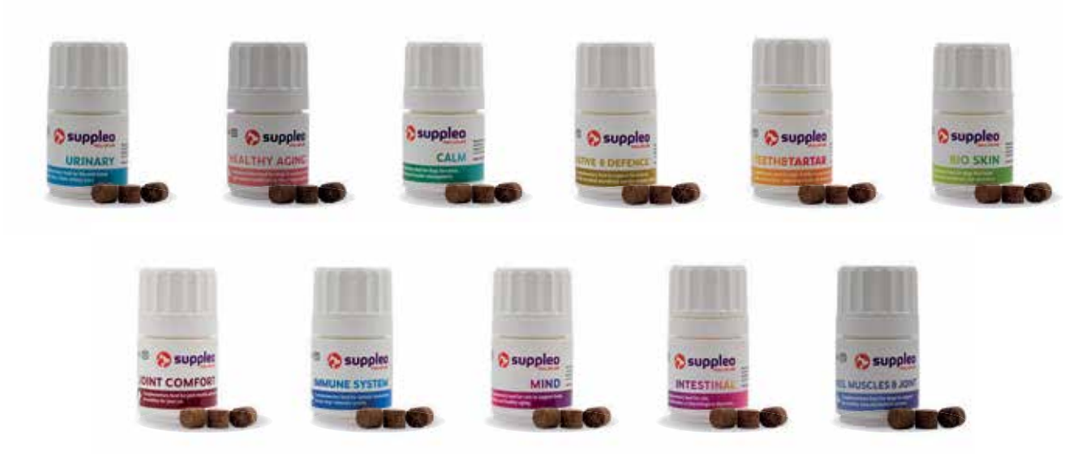
For over 25 years we have been involved in research, development and production of original and generic pharmaceuticals far human and veterinary use.
We are always focused on development of new projects and niche products that lead us to expand our portfolio and collaborations.
Over the years, the company has accompanied this work with the autonomous development of drugs and feeds, thanks to strengthening of the “research and development” area of the internal analysis laboratory: the industrial production of Friulchem brand complementary feeds in the form of granules and mixtures far livestock and ***Fc-Cubes® highly palatable chewable tablets for pets (dogs and cats) falls under this area***.

Research & development-Study and Innovation

Our research and development division has been recognized as one of the high-value laboratories of our region, Friuli Venezia Giulia. A facility that can offer external services to third-party companies. Our goal is to attract and unite partners, urging them to share values and guidelines in arder to create a system of shared beliefs and significance.

Support and Protection

One of Friulchem’s specializations is the creation of veterinary products and complementary feeds in the form of highly palatable chewing tablets, whose flagship brand is Suppleo. Suppleo is the new range of complementary pet foods for dogs and cats based on Italian Fc-Cubes® technology patented by Friulchem.
Suppleo, thanks to the technological contribution of Friulchem, has developed a differentiating production method which allows us to achieve a product that is easily. chewable for your pets.
In addition, the careful selection of ingredients and high quality standards have made it possible to obtain a chewable tablet very palatable to dogs and cats. The different product lines allow prevention of physical problems and support for the aging of our four-legged friends.



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