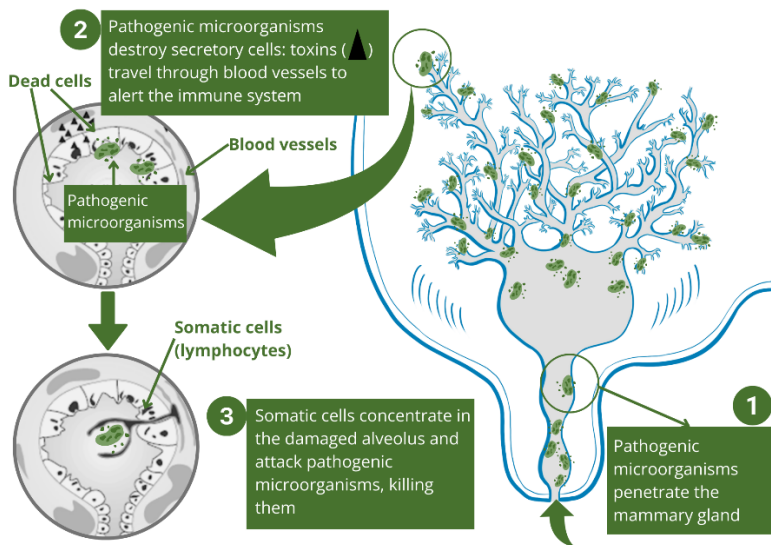




## MECHANISM OF FORMATION



1. Pathogenic microorganisms penetrate the udder (as shown in the image).
2. Pathogenic microorganisms destroy secretory cells: toxins activate the body's defense systems through blood vessels (as shown in the image).
3. Somatic cells concentrate in the damaged alveoli and attack pathogens, destroying them (as shown in the image).

## Mechanism of the Inflammatory Response in the Cow's Udder

Stage	Description	Actions and Reactions
<b>1. Pathogen Penetration</b>	Pathogenic microorganisms (bacteria, fungi, algae) enter the milk ducts and alveoli of the udder.	Pathogen multiplication triggers the activation of the immune system.
<b>2. Cell Destruction and Activation of the System</b>	Pathogens release toxins that destroy the secretory cells of the mammary gland. Toxins activate immune cells through blood vessels.	- Secretory cells die. - Immune cells are directed to the affected area.
<b>3. Immune Response: Action of Somatic Cells</b>	Somatic cells (macrophages, lymphocytes, neutrophils) concentrate in the affected alveoli.	- Somatic cells attack pathogens. - Pathogens are destroyed, and inflammation is reduced.

## WHAT CAUSES AN INCREASE IN SOMATIC CELLS? HOW MUCH DOES MASTITIS COST THE FARM?

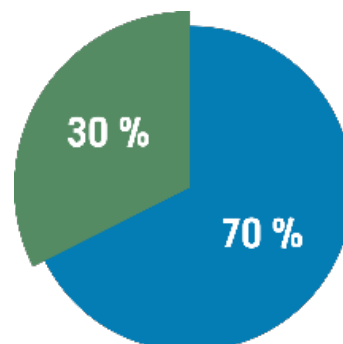
In the image:

### Blue Color – PRODUCTION LOSSES

- 200,000 somatic cells = 0% loss
- 500,000 somatic cells = 6% loss
- 1,000,000 somatic cells = 18% loss
- 1,500,000 somatic cells = 29% loss

### Green Color – OTHER LOSSES

- Reduction in milk price
- Costs of therapy
- Discarded milk
- Increased expenses for herd renewal



Trading Office: 68 Craven Park Road London N15 6AB

Web Site: [www.clusternanotech.com](http://www.clusternanotech.com)

e-mail: [info@clusternanotech.com](mailto:info@clusternanotech.com)

BANK HSBC IBAN GB20MIDL40051573566556 BIC MIDLGB22

VAT Number GB140901153 (EORI) Number – GB140901153000

Business relationships: *Kariné Musailova*

e-mail: [export@clusternanotech.com](mailto:export@clusternanotech.com)

EU DIRECTIVE		
(Regulation 852/2004) NEW HYGIENE REGIME FOR FOOD PRODUCTS	(Regulation 178/2002)	(Regulation 854/2004) OFFICIAL CONTROL OF PRODUCTS OF ANIMAL ORIGIN INTENDED FOR HUMAN CONSUMPTION
(Regulation 853/2004) SPECIFIC HYGIENE RULES APPLICABLE TO FOODSTUFFS OF ANIMAL ORIGIN	(Regulation 882/2004) OFFICIAL CONTROL OF ANIMAL-BASED PRODUCTS INTENDED FOR HUMAN CONSUMPTION	(Regulation 853/2004) SPECIFIC HYGIENE RULES APPLICABLE TO FOODSTUFFS OF ANIMAL ORIGIN
		(Regulation 2002/99 CE) VETERINARY POLICIES REGULATING THE PRODUCTION AND DISTRIBUTION OF ANIMAL-BASED PRODUCTS INTENDED FOR HUMAN CONSUMPTION

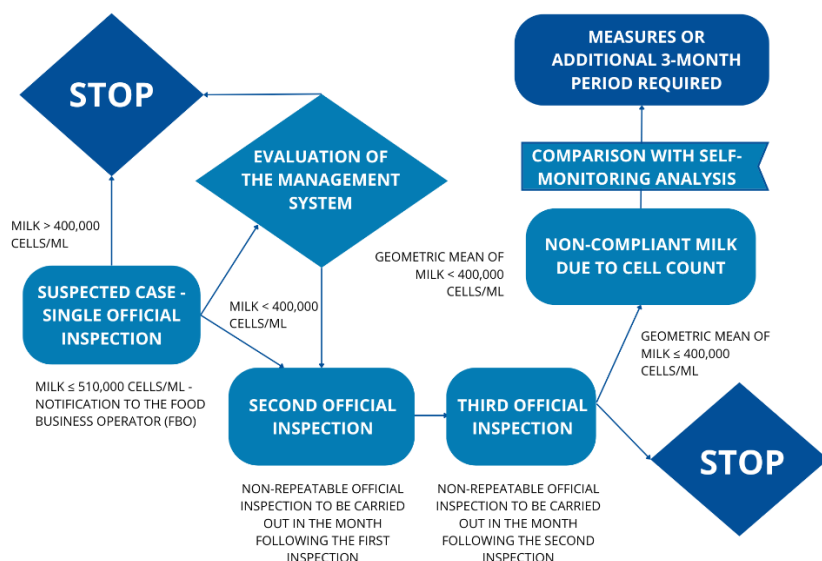
## PARAMETERS (SMOOTHING MOVING GEOMETRIC AVERAGE)

Table: Raw Milk Control Parameters

Product Type	Criterion	Limit	Calculation Method	Control Frequency
Raw cow's milk	Microbial content at 30°C (per ml)	≤ 100.000	Smoothing moving geometric average calculated over a 60-day period	At least one sample every 15 days
	Somatic cell content (per ml)	≤ 400.000	Smoothing moving geometric average calculated over a 90-day period	At least one sample every 30 days
Raw milk from other animal species	Microbial content at 30°C (per ml)	≤ 1.500.000	Smoothing moving geometric average calculated over a 60-day period	At least one sample every 15 days
Raw milk from other animal species intended for the production of heat-treated products	Microbial content at 30°C (per ml)	≤ 500.000	Smoothing moving geometric average calculated over a 60-day period	At least one sample every 15 days

## MONITORING SYSTEM

### DIAGRAM FOR CONDUCTING OFFICIAL ANALYTICAL CONTROLS



The diagram represents the system for monitoring somatic cell count (SCC) in milk, detailing the steps from the initial analysis to the implementation of corrective actions or the cessation of inspections.

The process for monitoring milk for somatic cell content includes the following stages:

1. **Initial Check:**

- If the milk contains  $\leq 400,000$  cells/mL, the inspection process is terminated, and the milk is deemed compliant with standards (**STOP**).
- If the somatic cell count exceeds 400,000 cells/mL, there is suspicion of an issue, and the first official inspection is conducted.

2. **Second Official Inspection:**

- If the second test confirms an SCC exceeding 400,000 cells/mL, a third official inspection is conducted.
- If the SCC exceeds 510,000 cells/mL, information is reported to the competent authorities (OSA), as this indicates a serious violation.

3. **Third Official Inspection:**

- If the geometric mean SCC from the three tests exceeds 400,000 cells/mL, the milk is classified as non-compliant.

4. **Follow-Up Actions for Non-Compliance:**

- The results are compared with self-monitoring data from the farm.
- If non-compliance is confirmed, measures are taken (e.g., treating affected animals, improving housing or feeding conditions), or an additional 3-month observation period is imposed.

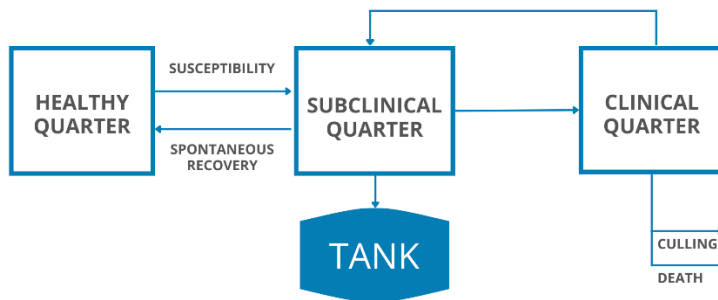
5. **Conclusion of Inspections:**

- If, after all measures, the geometric mean SCC is  $\leq 400,000$  cells/mL, the milk is deemed compliant, and the inspection is concluded (**STOP**).
- This process ensures milk quality control, prevents the spread of diseases within the herd, and minimizes health risks for consumers.

## DYNAMICS OF SUBCLINICAL MASTITIS DEVELOPMENT


### (High Somatic Cell Count)

Subclinical mastitis with elevated SCC may result in either spontaneous remission or require antibiotic treatment.



The diagram illustrates the dynamics of changes in the condition of udder quarters:

- A **healthy quarter** may become subclinical due to susceptibility or return to a normal state through spontaneous remission.
- A **subclinical quarter** can progress to a clinical state, be directed to the bulk tank, or revert to a healthy state.
- A **clinical quarter** is either directed to the bulk tank, leads to culling, or results in the death of the animal.

	<h2>NATIONAL PLAN FOR COMBATING ANTIBIOTIC RESISTANCE PUBLISHED</h2>
<p>For every new natural antimicrobial substance, a corresponding resistance mechanism exists in nature. The introduction of antibiotics in both human and veterinary medicine has created additional selective pressure. The first National Plan for Combating Antibiotic Resistance (<b>PNCAR 2017–2020</b>), approved by the STATE-REGION conference, was published on <b>the website of the Ministry of Health</b>.</p>	
<p>The National Plan for Combating Antimicrobial Resistance (<b>PNCAR 2017–2020</b>) was approved on November 2, 2017, through an agreement between the Government, the Regions, and the autonomous provinces of Trento and Bolzano. The plan aims to address antibiotic resistance, a significant issue in Italy. (<a href="https://www.salute.gov.it/portale/documentazione/p6_2_2_1.jsp?id=2660&amp;utm_source=chatgpt.com">https://www.salute.gov.it/portale/documentazione/p6_2_2_1.jsp?id=2660&amp;utm_source=chatgpt.com</a>). You can read the full text of the plan on the official website of the Italian Ministry of Health at the following link: <a href="https://www.salute.gov.it/imgs/C_17_pubblicazioni_2660_allegato.pdf?utm_source=chatgpt.com">https://www.salute.gov.it/imgs/C_17_pubblicazioni_2660_allegato.pdf?utm_source=chatgpt.com</a></p>	

## ANTIBIOTIC CATEGORIZATION: INCLUSION OF CIAs

**CIAs (Critically Important Antibiotics)** are a category of antibiotics identified by the World Health Organization (WHO) as critically important for treating human infections. The inclusion of such antibiotics in monitoring and usage plans is aimed at reducing their application in veterinary medicine to minimize the risk of developing antibiotic resistance.

Antibiotic categorization is based on the following criteria:

- The importance of the antibiotic for treating infections in humans.
- The risk of resistance development associated with its use in veterinary medicine.

Trading Office: 68 Craven Park Road London N15 6AB

Web Site: [www.clusternanotech.com](http://www.clusternanotech.com)

e-mail: [info@clusternanotech.com](mailto:info@clusternanotech.com)

BANK HSBC IBAN GB20MIDL40051573566556 BIC MIDLGB22

VAT Number GB140901153 (EORI) Number – GB140901153000

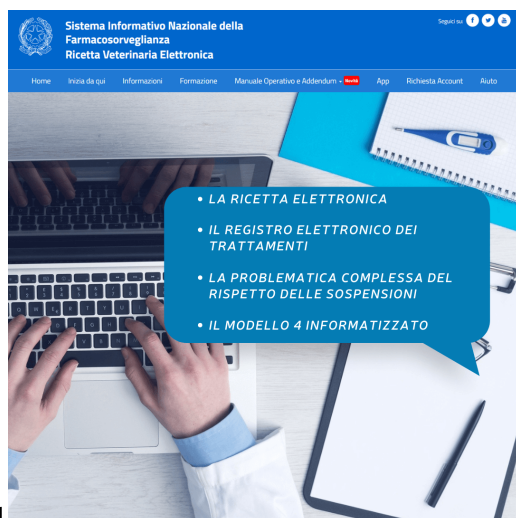
Business relationships: [Kariné Musailova](mailto:Kariné.Musailova)

e-mail: [export@clusternanotech.com](mailto:export@clusternanotech.com)

- The availability of alternative treatments for animals.

Table: Classification of antibiotics and their usage.

Category	Description	Note
EMA	Classification of antibiotics for use in animals to promote prudent and responsible application.	Prudent use reduces the risk of developing bacterial resistance.
One Health	Antibiotic resistance can spread between humans, animals, and the environment.	A multidisciplinary approach is required to control the spread of resistance.
AMEG Expert Group	Classification of antibiotics based on their impact on public health and the need for use in animals.	Considers the risk of resistance and the importance of the drug in veterinary medicine.
Special Attention	Antibiotics used in both humans and animals, as well as last-resort drugs for severe infections.	Misuse could lead to the loss of their effectiveness in human medicine.



The images provide information about the National Pharmacovigilance Information System and electronic veterinary prescriptions.

**First Image:**

**Key functions of the system:**

- Electronic prescription.
- Electronic treatment registry.
- Complex issues related to withdrawal periods.
- Computerized Model 4.

**Second Image:**

**Access instructions:**

- Use the Google Chrome browser.
- Enter "VETINFO" in the search bar.
- Click on the "RICETTA ELETTRONICA" button.

## ANTIBIOTIC USE IN CATTLE

**Legislation**, in addition to introducing antibiotic categorization for cattle, prohibits any form of preventive antibiotic use. One of the most common preventive practices is antibiotic therapy during the dry-off period.

Trading Office: 68 Craven Park Road London N15 6AB

Web Site: [www.clusternanotech.com](http://www.clusternanotech.com)

e-mail: [info@clusternanotech.com](mailto:info@clusternanotech.com)

BANK HSBC IBAN GB20MIDL40051573566556 BIC MIDLGB22

VAT Number GB140901153 (EORI) Number – GB140901153000

Business relationships: *Kariné Musailova*

e-mail: [export@clusternanotech.com](mailto:export@clusternanotech.com)

## DRY COW THERAPY

"Blanket" antibiotic therapy when transitioning cows to the dry period is a widely used practice in dairy farming to reduce the prevalence and frequency of intramammary infections (IMI).

This therapy is part of the **Recommended Mastitis Control Program** (NMC Factsheet – Dry Cow Therapy).

**Mastitis** is the most costly disease in dairy farming. Approximately **70–80% of economic losses** are associated with the subclinical form of mastitis (Seegers et al., 2003; Halasa et al., 2007).

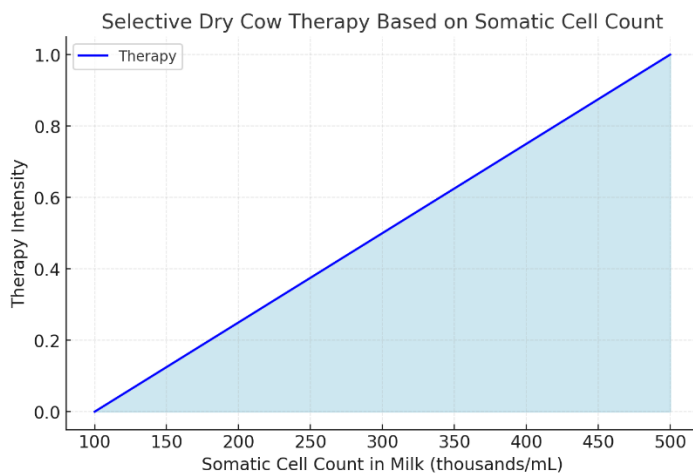
**70% of antibiotics** used in dairy farming are aimed at treating mastitis (van Werven, 2014), of which **40% are used during the dry period** (Kuipers et al., 2016).

## SELECTIVE DRY COW THERAPY (SDCT)

The objective of SDCT is **singular**:

1. Treat existing infections at the time of transitioning cows to the dry period.

The percentage of cows subjected to such treatment depends on the health status of the herd, which is indirectly linked to the average somatic cell count in the milk.



The chart illustrates **Selective Dry Cow Therapy (SDCT)** intensity as a function of the somatic cell count (SCC) in milk.

**Key points from the chart:**

- The x-axis represents the somatic cell count in milk (thousands per mL).
- The y-axis shows the intensity of therapy.
- As SCC increases from 100,000 to 500,000 cells/mL, the intensity of therapy also increases linearly.
- The shaded area indicates the application range of therapy, with higher SCC requiring more intensive treatment.

This demonstrates that SDCT is proportionally applied based on the SCC levels in milk, aiming to target cows with higher infection risks.

## INTERNATIONAL MASTITIS CONTROL PROGRAMS

1. Setting clear goals to ensure udder health.
2. Providing a clean, dry, and comfortable environment for cows.
3. Following proper milking procedures.
4. Ensuring proper maintenance and use of milking equipment.
5. Keeping accurate and timely records.
6. Effectively managing clinical cases of mastitis during lactation.
7. Properly managing dry cows and pregnant heifers.
8. Guaranteeing biosecurity against infectious pathogens and culling chronically ill cows.
9. Regularly monitoring udder health.
10. Periodically reviewing the mastitis control plan.

Trading Office: 68 Craven Park Road London N15 6AB

Web Site: [www.clusternanotech.com](http://www.clusternanotech.com)

e-mail: [info@clusternanotech.com](mailto:info@clusternanotech.com)

BANK HSBC IBAN GB20MIDL40051573566556 BIC MIDLGB22

VAT Number GB140901153 (EORI) Number – GB140901153000

Business relationships: [Kariné Musailova](mailto:Kariné.Musailova@clusternanotech.com)

e-mail: [export@clusternanotech.com](mailto:export@clusternanotech.com)

Source: National Mastitis Council (NMC), [official NMC website](https://www.nmconline.org/?utm_source=chatgpt.com)  
[https://www.nmconline.org/?utm\\_source=chatgpt.com](https://www.nmconline.org/?utm_source=chatgpt.com)

## OUTLOOK FOR CHRONICALLY ILL ANIMALS: THE "CHRONIC COW" PROBLEM

- Every farm has a percentage of animals with consistently high somatic cell counts.
- These are often cows missing one or more teats.
- Their history includes multiple episodes of clinical mastitis.
- Usually, they are older animals (more than four lactations).
- Suffering from chronic udder infections caused by various pathogens.
- Udders show varying degrees of anatomical damage.

## SOMATIC CELL ISSUE: A PROBLEM FAR FROM RESOLUTION

1. Strict operational protocols.
2. Reduction in antibiotic use.
3. Use of antibiotics with long withdrawal periods.
4. Refusal of therapy.
5. Formation of a group of chronic animals.
6. Persistent economic losses.

## A NEW SOLUTION FOR DAIRY FARMING SALVALAT Lavanda Funzionale



- ✓ **NOT A MEDICINAL PRODUCT**, therefore it is not subject to pharmacological regulations on distribution and use.
- ✓ Has **extremely short recommended withdrawal periods**.
- ✓ Delivers **positive results in a high percentage of cases**.
- ✓ Offers **low treatment costs**.

## SALVALAT Lavanda Funzionale

Reduces or completely eliminates the risk of mastitis becoming chronic, **allowing the animal to remain productive in the herd**.

Supports effective management of the geometric mean somatic cell count.

Trading Office: 68 Craven Park Road London N15 6AB

Web Site: [www.clusternanotech.com](http://www.clusternanotech.com)

e-mail: [info@clusternanotech.com](mailto:info@clusternanotech.com)

BANK HSBC IBAN GB20MIDL40051573566556 BIC MIDLGB22

VAT Number GB140901153 (EORI) Number – GB140901153000




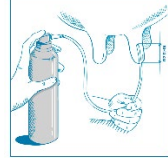
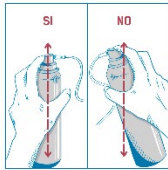
Business relationships: *Kariné Musailova*

e-mail: [export@clusternanotech.com](mailto:export@clusternanotech.com)



## RECOMMENDATIONS FOR USE

- Perform local **treatment of quarters testing positive for CMT (California Mastitis Test)**, ensuring thorough disinfection of the teat sphincter beforehand.
- Preferably use **before the second rise in somatic cell count levels**.
- **Do not use in cows with acute mastitis**

	<p><b>Salvalat Lavanda Funzionale</b> With Glycolic Cucumber Extract, pH 5.6</p>	<p><b>CNT SALUS MUNDI</b> Animal Health Line www.salusthermae.com</p>
<p><b>DESCRIPTION:</b> <b>SALVALAT LAVANDA FUNZIONALE</b>, part of the Animal Health Line, is a functional intramammary rinse of bio-inorganic origin designed for "cleaning and removing" bacterial biofilm formed in the milk ducts and udder cisterns of dairy cows. This product works locally, providing a surface-level effect without systemic impact. It is not an antibiotic and does not penetrate or spread within the animal's body.</p> <p><b>SINGLE-USE CATHETER:</b> The catheter consists of a tube with three openings at the end, inserted into the teat, and a connector that attaches to the bottle dispenser.</p> <p><b>INDICATIONS FOR USE:</b> For removing bacterial biofilm from the udder of dairy cows.</p> <p><b>METHOD OF APPLICATION:</b></p> <ol style="list-style-type: none"> <li>1. Perform the rinse on an emptied udder immediately after milking, having cleaned and disinfected the teat beforehand.</li> <li>2. One rinse per teat.</li> <li>3. Insert the catheter into the teat to a depth of 10–12 cm.</li> <li>4. Avoid contact with the sterile portion of the catheter that enters the teat.</li> <li>5. Residues of the product and biofilm are removed during subsequent milkings.</li> <li>6. Do not use milk obtained within the first 24 hours after treatment.</li> <li>7. Use the entire bottle's contents for each treatment.</li> </ol> <p><b>COMPOSITION:</b> Propylene Glycol, Aqua (Deionized Water), Glycerin, Cucumis Sativus Fruit Extract, Polysorbate 20, PVP.</p> <p><b>PROPELLANT:</b> Nitrogen.</p> <p><b>CONTRAINDICATIONS:</b> Known hypersensitivity to any of the product's components.</p> <p><b>POSSIBLE SIDE EFFECTS:</b> The animal may exhibit reactions during treatment. These reactions are not indicative of pain but rather discomfort.</p> <p><b>WARNINGS:</b> shake the bottle before use. Hold the bottle strictly upright! Incorrect use may reduce product effectiveness. Keep out of reach of children.</p> <p><b>STORAGE CONDITIONS:</b> store at a temperature not exceeding 40°C.</p> <p><b>VOLUME:</b> 100 mL / 150 mL.</p> <p><b>SHELF LIFE:</b> 24 months from the date of manufacture.</p> <p><b>MANUFACTURER:</b> CNT Salus Mundi S.r.l.; Via Cardano 32, 43036 – Fidenza (PR) – ITALY; www.salusthermae.com; info@cntsalsumundi.com; tel.: +39 0524 681024. Everton S.r.l.; Via Azzano 11, 37064 – Povegliano V.se (VR) – ITALY.</p> <p><b>XCLUSIVE DISTRIBUTOR (Italy):</b> D.e.r.p.a. Mn-cr S.r.l.; Via L.Benati 54, 46048 – Roverbella (MN) – ITALY; derpamncr@gmail.com.</p>		 <p>Shake the bottle before use. Remove the cap from the <b>SALVALAT Lavanda Funzionale</b> spray bottle and attach the catheter to the bottle dispenser.</p>  <p>Ensure the catheter is securely connected.</p>  <p>Insert the catheter into the teat to a depth of 10–12 cm. Avoid contact with the sterile part of the catheter that enters the teat. Press the dispenser and use the entire contents of the bottle.</p>  <p>Hold the bottle strictly upright! Improper use may reduce product effectiveness.</p>







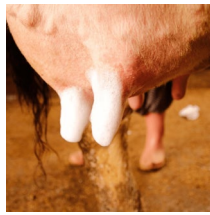
**STEP 1:  
STRIPPING**



**STRIPPING**

As the first step, perform at least 5–6 stripping actions for each teat. This helps identify animals with altered milk consistency, poor milk quality, or other issues.

**STEP 2:  
DISINFECTION**



**DISINFECTION**

Treat the teats with a disinfectant solution to ensure cleanliness and reduce bacterial contamination.

**STEP 3:  
DRYING**



**DRYING**

Gently dry the teats with a clean towel to prepare them for milking.

**STEP 4:  
ATTACHMENT**



**ATTACHMENT**

Securely attach the milking equipment to the teats, ensuring proper alignment and vacuum levels.

**STEP 5: POST-  
MILKING  
DISINFECTION**



**POST-MILKING  
DISINFECTION**

Apply a disinfectant to the teats after milking to prevent infections and promote udder health.

## INNOVATIONS AND DEVELOPMENT IN LIVESTOCK MANAGEMENT

Welcome to our company. We are proud to introduce our **Research and Development Division**, dedicated to enhancing and creating solutions for farmers and livestock professionals.

Our division conducts thorough research and testing, combining theoretical and practical approaches to achieve high-quality products. Additionally, we collaborate with independent laboratories to obtain necessary certifications, ensuring the safety and reliability of our solutions.

We extend our gratitude to veterinarians **Giuseppe Orsi** and **Marzio Schianchi** for their contributions to the development and support of these projects. Their expertise in herd management, prophylaxis, CNCPS nutrition, hygiene, and milk quality has made these initiatives possible.

We are confident that our solutions will help improve livestock management and animal health while optimizing the efficiency of farming operations.

Thank you for your attention! We are always available to provide further information about our products and initiatives.

**Clusternanotech Group, in collaboration with DOTT. GIUSEPPE ORSI (Management of the herd, prophylaxis, CNCPS nutrition, hygiene, and milk quality) and DOTT. SCHIANCHI MARZIO (Veterinary LP).**