

'Yuna-O'range – Naturally Yours

Mr. Rohit Kumar Vohra

M.D – Aayam Herbal & Research Industries- Jaipur
Email: aayamherbal@gmail.com, Mob: 09829000096

The article is about dairy preservative Yuna -O'range which is a New Natural preservative and sanitizer product, duly approved by CODEX, highly used in developing countries's Dairy industry as Citrox in today's time .Yuna-o'range is a Non Chemical preservative and sanitizer made from orange peel and citrus juice/s.

Let's begin with the Introduction to give you a better view of the dairy preservative and its uses.

Today commercial milk production is a major but complex industrial process where a number of things have to be kept in mind before taking on the actual production.

A dairy herd can range in size from a few cows to several thousands and the milk may be stored on the farm for up to two days and transported long distances to urban centers for distribution as liquid milk or processed into cheese, butter, milk powder and many other products. These milk & dairy products may not be consumed for weeks or months after the milk is produced and sent away for consumption. Since milk and milk products are perishable foods high standards are required, for a successful, profitable dairy industry. The milk leaving the farm must be of good nutritional and bacteriological quality and be uncontaminated by soil and chemical pollutants. To a marked degree this quality depends on the methods of milking hygiene and milk storage on the farm.

Giving proper attention to sanitizing in the Dairy industry is of prime importance for various reasons some of which have been observed as under:-

- Milk and milk based products are playing an essential role in human nutrition providing the necessary nutritional elements in adequate amounts.
- They are also an excellent nutritional substrate for the growth of micro-organisms
- Micro-organisms can be divided into two categories:
 1. Those which spoil the products
 2. Pathogens which can cause food poisoning
- Both categories are important to modern dairy industry since the production of top quality products requires the supply of raw milk which preserves all the quality characteristics of its nature
- The shelf life of the products will be determined mainly from the initial microbiological status of raw milk.

Thus to maintain and avoid any disturbance in the human biological cycle we emphasize on sanitizing. When we think about Conventional Cleaning & Sanitizing we know that there are many pathogens associated with dairy products that can lead to food poisoning like:

Streptococcus Aureus, Salmonella bacillus Cereus, E. coli, Listeria Monocytogenes and Mycobacterium Para tuberculosi. Listeria Monocytogenes and Mycobacterium Para tuberculosis are a major concern to the dairy industry especially for pasteurized products since scientific data show the above bacteria can survive pasteurization products since scientific data show that the above bacteria can survive pasteurization treatment.

To eliminate spoilage of dairy products and pathogen growth, systems based on physical treatments with the combination of preservatives are usually based while installations and equipment are cleaned and sanitized using harsh chemicals.

Hygiene is another crucial area when we talk about Dairy Industry and the Yuna-O'range hygiene range includes novel products that address the growing demands for replacing potentially harmful, synthetically based products for use in cleaning and sanitizing operations in the dairy industry.

Yuna-O'range iconology incorporates a truly holistic approach designed to increase the effectiveness and efficiency of cleaning & sanitizing operations using non-toxic and non-corrosive Formulations, some of which even carry organic status. The various products are effective over a wide range of pathogens, including gram positive and negative bacteria, viruses, moulds, yeasts and fungi.

The **benefits** or the significant results arrived at with the use of Yuna-O'range are:

Broad spectrum bactericidal and sporocidal activity, non-toxic, naturally derived ingredients, non-corrosive, hypo-allergenic, strong residual effect, breaks, down biofilm, effective in the presence of organic matter, do not alter the taste or color of the food, Safe to use on all surfaces and fabrics, No fragrance or dye added are stored easily.

The dairy products have been tested with a numerous Pathogens till date, to name a few we have:

Bacteria

Campylobacter jejuni, Dipiodia natalensis, Escherichia coli, Geotrichum candidium, Klebsiella pneumonia, Lactobacillus pentoaceticus, Legionella pneumophila (NCTC 11192), globosum, Listeria monocytogenese, MRSA (clinical strain), Mycobacterium fortutium (NCTC 8573), Proteus vulgaris, Pseudomonas aeruginosa (ATCC 15442), Salmonella cholerasuis, Salmonella typhimurium (DT004), Staphylococcus aureus (NTCT 6571), Staphylococcus pyogenes, Staphylococcus pyogenes Staphylococcus sp., Streptococcus faecalis

Yeast and Fungi

Mucor sp, Geotrichum candidium, Fusarium sp., Collectotricum sp., Cladosporium, Chaetonium, Candida glabrata, Candida albicans Botrytis cinerea, Aspergillus terreus, Aspergillus niger, Aspergillus flavus, Penicillium sp., Penicillium

PROCESSING TECHNOLOGY

digitatum, *Penicillium italicum*, *Penicillium ropueforti*, *Phomopsis orl*, *Pullularia pullulans*, *Phthium sp.*, *Trichophyton interdigitale*, *Trichophyton mentagrophytes*



The tests regarding all the pathogens/viruses are carefully and properly conducted at independent laboratories. Certificates & reports are available on request.

Pathogens tested to date

Viruses

Human Rhinovirus – Retroscreen Virology, Influenza A – Retroscreen Virology, Human immunodeficiency Virus (HIV) – Retroscreen, Virology, Urbani SARS – Retroscreen Virology, African swine fever, Avian influenza, Foot & Mouth disease, Gumboro Virus, Herpes Virus, Herpes Virus, Herpes Virus type 1 & type 2, Herpes zoster, Hepatitis A & B, Newcastle disease, Severe Acute Respiratory Syndrome (SARS)

Protozoa

Histomonas meleagridis, *Giardia lamblia*, *Entamoeba histolytica*, *Blastocystis hominis*

The tests regarding all the pathogens/viruses are carefully and properly conducted at independent laboratories. Certificates & reports are available on request.

The highest level of check has to be kept for **Controlling of Mastitis** in the Milking process of the cows.

As Mastitis's is an inflammation of the udder (mammary gland) and is common in dairy herds causing important economic losses as milk is the basic factor for the production of the dairy products. Mastitis's cannot be eradicated but can be reduced to low levels by good management of dairy cows.

Although bacteria, fungi, yeasts and possibly virus can cause udder infection but the main agents remain bacteria. The most common pathogens are **Staphylococcus aureus**, **Streptococcus agalactiae**, **Str. Dysgalactiae**, **Str. Uberis** and **Escherichia coli** though other pathogens can cause occasional herd outbreaks.

Mastitis occurs when the teats of cows are exposed to pathogens which penetrate the teat duct and establish an infection in one or more quarters within the udder. In case of **chronic mastitis** it is a direct economic loss to the farmers as it results in:

***Milk yield reduction *Low quality milk with decreased shelf life**

Chronic Mastitis milk is characterized by increased cell count, elevated total colony count (ICC) including pathogens, Slight pH differentiations and mineral imbalances.

Mastitis Management

Yuna-O'range outline protocol eliminates the risk of udder infection in cows by micro-organisms, it promises goods quality production of milk in combination with good milking management system as compared to conventional antiseptics and antibiotics Yuna-O'range.

The products of Yuna-O'range are not susceptible to pathogen resistances and are characterized by long residual actions. Also they are harmless to animal skins or udder epithelium thus are proven to be effective according to the BS EN 1276 (European Suspension Test) giving a guaranteed 5 log reduction in bacterial load.

Mastitis control

To ensure Udder Cleanliness, Yuna-O'range wet-wipes are used before milking the cows and after milking Teat dipping Yuna-O'range antiseptic solution should be used. There is a surface sanitizer range made available by Yuna-O'range for the milk parlors to maintain cleanliness.

Personnel hygiene is of utmost importance in dairy industry to prevent any type of infection. Yuna-O'range Hand sanitisers are 100% natural, alcohol free and very effective against a wide range of bacteria, fungi and viruses. They are ideally suited for daily repeated use. A dispenser of Yuna-O'range hand soap and hand sanitizer should be placed next to wash basins to allow the operators to clean. Aprons, Gloves and Boots: these garments should be treated at intervals throughout the day with Yuna-O'range Sanitiser (at 0.5%)

Cleaning & Sanitising in Dairy processing

Daily routines for cleaning and disinfecting vary with the size and complexity of the milking installation but will include methods of: Removing dirt and cleaning the milk equipment also taking care of disinfection. Equipment cleaning regime plays an important role for product quality. Particularly, each cleaning regime must be effective enough to avoid fouling and remove biofilm: Fouling is the build-up of deposits on a surface, which beside increased operation cost, has an impact

PROCESSING TECHNOLOGY

on product quality by cross-contamination or microbial growth, Depending on heat treatment of milk dairy industry face two different types of deposits as seen in the table below :

Cleaning & sanitizing in dairy processing

In case of **hand milking**, bucket and direct-to-can milking machines, basic, manual methods of cleaning and sterilizing needs to be adequate and effective. For **pipeline milking** machines in-situ (cleaning in place) systems are necessary.

Milk can become grossly contaminated from bacteria on ancillary equipment which must also be cleaned and disinfected effectively. Coolers can best be cleaned & disinfected manually and stored in the dairy to drain.

Refrigerated bulk milk tanks can be cleaned either manually or for the larger tanks, by automatic, programmed equipment.

Foremilk cups can be a potent source of bacterial contamination and need to be cleaned and disinfected after each milking. They should then be stored in the dairy to drain.

It is important that the equipment is drained as soon possible after washing for storage between milking (whatever the method of cleaning used).

Following the sanitizing process effectively will ensure Bacteria will not multiply in dry conditions but water lodged in milking equipment will, in suitable temperatures, provide conditions for massive bacterial multiplication.

Yuna-O'range Main Applications

Yuna-O'range natural and non-corrosive cleaners and sanitizers can be used safely wherever efficient surface hygiene and cleaning is required in the dairy facilities.

Floors, walls, ceilings (Farm, milking parlors, etc), T transport vehicles, Shipping containers, Cool rooms, dump tanks, Waste bins, fabrics, drapes, Kitchen, bathrooms, toilets etc. are not in contact with milk based products but these surfaces must be cleaned and sanitized to avoid cross-contamination with foodstuffs.

The surfaces in direct contact with milk or milk based products:

Bench tops and cutting boards, Tools, utensils and automated milking equipment, Filters and tanks, Trays etc are few areas directly exposed to the milk or milk based products.

Direction for use of Yuna-O'range:

The work surfaces, storage area, ventilation systems, floors, walls, cool rooms, ventilation systems all needs regular treatment as it is necessary to maintain adequate standards of hygiene in all processing areas. Hose down surfaces requires water to be cleaned to remove slime, milk residue and debris from between processes. So Clean with Yuna-O'range Cleaner 14XP at required dilutions, depending upon the degree of soiling, nature of the surface to be cleaned and hardness of water (1 to 10%) then leave for 15-20 minutes and then finally rinse off thoroughly. Use a solution of Yuna-O'range Sanitizer 14WPS2 (0.5%) to create a protective ongoing effect, fog packaging area with Yuna-O'range Sanitizer 14WPS2 (5%) at the end of each shift locker rooms, toilets and showers. Spray / fog daily with Yuna-O'range Sanitizer 14WPS2 (2% / 5%).

The cleaning and disinfecting of containers, trays and transportation vehicles used for the storage / transport of milk products should be carried out immediately after unloading. The technique of application is to work from the back to the front of the container and clean it thoroughly.

Deposits should be removed with Yuna-O'range Cleaner 14XP with a dilution strength depending upon the degree of soiling and nature of surface to be cleaned (1 to 10%). Moreover the basic cleaning process remains the same, leave for 15-20 minutes, rinse off thoroughly and then apply Yuna-O'range Sanitizer 14WPS2 (0.5%) (Spraying / forging at 2% / 5%) to minimize the risk of cross contamination during the transport of products. A similar procedure should be applied to tools and utensils including knives, cutting blocks, etc

Applications: closed systems (CIP)

COMMON PROBLEMS/CONTAMINATION'S IN PIPELINES AND TANKS

Fact	White greasy film water droplets clinging to walls of pipelines due to low temperature (i.e. below fat pour point)
Protein	Bluish colored film in pipeline or tanks (food tankers storage vessels etc.
Calcum and Magnesium	Grayish white film on tanker wall or in pipeline due to high water hardness.
Milk stone	White or yellow residue in pipeline due to minerals in the water reacting with proteins from the milk
Iron	Reddish brown to dark brown residues in pipeline due the excess iron in water supply.
Black	Black smudges or streaks in pipelines usually due to decomposition of rubber components.

High levels of iron in the water may be removed by special water conditioning before additional of chlorine products.

The Applications for pipelines and bulk tanks provide us with:

Yuna-O'range Non-foaming Cleaner (14TP) which can be used to replace harsh caustic and acid cleaners currently used in cleaning closed system (CIP). It accelerates the dissolution of fats, proteins, oil fibers and milk stone that adhere to the surfaces of pipelines, tanks and vessels (e.g.: pasteurizers)

RINSE CYCLE: The first rinse cycle should have water temperature not more than 50 oC, and be run as programmed.

PROCESSING TECHNOLOGY

WSH CYCLE: Use water temperature of 40°C as the starting point and allow the system to operate as programmed then add Yuna-O'range Non-foaming Cleaning (14TP) to the wash cycle at a rate of 5% depending on degree of soiling.

FINAL RINSE: For complete sanitizing effect, use Yuna-O'range 14WPS2 at 0.5% (+0.01% of organic antifoam) after the use of 14TP. Then rinsing is not required.

Test Conditions: For conducting the test- take 200 grams of 5% Solution; 1 gram of reagent grade Calcium Carbonate powder add Calcium Surface and mix for one minute then vacuum filter after one minute and record the weight of the undissolved Calcium Sulfate, calculate and record the percentage of Calcium Carbonate that has been dissolved.

Benefits of using Yuna-O'range Cleaners and Sanitizers are:

- ~ It is highly effective and low dosage is required, saves water saving (non-rinse sanitizers)
- ~ Requires low dilution temperature (<40°C)
- ~ Suitable for all surfaces and machinery (non-corrosive)
- ~ It is eco-friendly, naturally derived products
- ~ Removes biofilms
- ~ Anti-microbial effect (e.g.: Salmonella, Listeria, etc.)

Production of Dairy Products

Dairy products are susceptible to microbial spoilage as they are an ideal substrate for their growth; So Yuna-O'range range offers new natural solutions to the dairy industry:

- ~ "Clean" labeling
- ~ Conforms to EU Regulation 88/388/EC (Yuna-O'range Flavour Compound)
- ~ Complies to Organic regulation (Yuna-O'range Flavour Compound)
- ~ Complies to Organic regulations (Yuna-O'range 14WP Decontaminant,
- ~ Yuna-O'range Flavour Compound)
- ~ Effective at low concentration

The various applications are:

Yoghurt Production, Natural Cheese, Processed cheese, Cheese preparation; Ice cream Production, Cream Production, Full Cream & Skim milk powders, Brine process etc

1) Example of Applications:

Results of adding Yuna-O'range Flavor FL002 in white cheese brine compares to competitor's products. Yuna-O'range Flavor Compound was challenged against competitor's products (Additive) in white cheese brine (against mold & yeasts) at two different maturation temperatures. The result was Yuna-O'range managed to control effectively the count of yeast & mold.

2) Another example could be Fruit Yoghurt Protocol:

Yuna-O'range Flavor Compound (FL002) is used as a natural preservative in fruit preparation, standardization of milk fat content, homogenization, Heat treatment Cooling and inoculation with starters, Incubation At pH = 4.6, filter & Cool to 22°C, Add fruits & Yuna-O'range Flavor Compound at 0.2% then fill into retail containers. Then it is the time for Cooling & Storage of the fruits.

3) The third example we take is of Cottage Cheese Protocol

Yuna-O'range Flavor Compound (FL002) is used as a natural preservative to extend the shelf life of cheese and related products following the below mentioned process:

Firstly skim the milk, then Pasteurization, then you cool it, add starter & rennet, cut it, then scalding, washing, adding cream and lastly packing & storage.

Other applications

Soft cheese- Yuna-O'range products can successfully be applied in the production of soft cheese (feta cheese). The way of application depends on the packing of final product as follows:

Option 1: Feta is vacuumed and packed in a plastic foil. Spraying or fogging Yuna-O'range 14CP. Before packaging.

Option 2: Feta is packed in drums with brine. Apply Yuna-O'range FL002 inside the Maturation brine (from 750ppm to 0.1%) A second application might be needed as well as inside the final brine (from 0.1 to 0.5%) A second application might be needed a Spraying: 0.5 to 0.75% - Fogging: 5% to 0.1%.

Semi-hard cheese: In case salting with brine is used, use Yuna-O'range FL002 at between 0.1 and 0.2% Before the final packaging, inside the brine bath use Yuna-O'range FL002 at a percentage of 0.2 to 0.5%

Whey-cheese: Adding of Yuna-O'range 14CP (0.5%) or Yuna-O'range FL002 (0.2%) inside the whey.

Spreadable cheese: Depending on the pH of the spreadable cheese the dosage varies. Usually add Yuna-O'range FL002 (0.2%) during the final mixing before packaging

Processed cheese (toast cheese, block cheese): Use Yuna-O'range FL002 at 0.1-0.2% inside the water (recipe). For spreadable processed cheese use Yuna-O'range FL002 at 0.1% and add citric acid if further Dropping of pH is needed in order to reach desirable pH of product.

Fruit – Yoghurt: Use Yuna-O'range FL002 at 0.1 – 0.2% inside the fruit-paste.