



May 23 & 24, 2023

**NOVEL PLANT-BASED INGREDIENTS  
FOR  
NATURAL & CLEAN LABEL  
SHELF-LIFE EXTENSION**



# AGENDA

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Intro MILLBO/MILLBIO

X-TRA GUARD™ Rowan berry extract

Product range cultured flours & sourdoughs

Synergies

Conclusions

# MILLBO/MILLBIO

**MILLBIO**, headquartered in Northern Italy, was founded in 1995 and focuses on highly innovative, clean-label and all-natural solutions for baking, food & beverage applications.

The acquisitions of **Bionaturals** and **Shanghai Millbio Biotec** allowed expanding its position as a leading global player in food ingredients such as fermented/cultured flours and plant extracts addressing the increasing demand for clean-label shelf-life extension.



# THE RIGHT SOLUTION FOR YOUR PRODUCT

## COLOR



**Malts  
Mixes**



All the colors of nature to make your products even more appetizing, to eat with your eyes too.

## TASTE



**Fermented Flours  
Sourdough  
Malts**



Natural solutions conceived to improve the aroma and flavor of bread and oven-baked products.

## SHELF LIFE

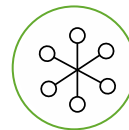


**Fermented Flours  
Plant Extracts  
Enzymes**



A range of solutions created to increase the shelf life and freshness of your products.

## STRUCTURE



**Improvers  
Enzymes**



Products for high-quality baking: from softness to crispiness.

## NUTRITIONAL



**Enzymes  
Sourdough**



Innovative solutions for increasingly good, nourishing and sustainable products.

MILLBIO NATURAL  
SHELF-LIFE SOLUTIONS  
FOR FOOD & BEVERAGES

## ROWAN BERRY EXTRACT

**Sorbus aucuparia L.**  
(n.) [cent. XV; lat. Scient. sorbus]

*"Latin name used in the botanical classification to indicate trees and saplings of the rosaceae pomeoides genus: The Rowan Berry Tree. The tree has orange or scarlet fruits with a 1cm diameter from which an edible essence, much loved by birds, (Aucuparia) can be extracted".*

*X-TRA GUARD is a natural ingredient which has been extracted from the Rowan berry with the use of a tapioca flour carrier.*

*It has been meticulously developed to help long shelf life products and is wholly derived from the Rowan berry's natural botanical compounds, which includes Organic Acids.*

*It protects against spoilage (yeasts & molds)*

PRODOTTO VINCITORE  
FOOD INGREDIENTS  
AWARD 2021

**FOOD  
MATTERS**  
live

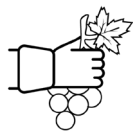
## WHAT IS X-TRA GUARD™?

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- ✿ **X-TRA GUARD™** is an aqueous extract from **Rowan Berries** and includes natural botanical compounds found in the fruit
- ✿ Incorporating a **tapioca starch carrier** to standardize the content and to facilitate extraction and handling
- ✿ A fully cold-water-soluble version, **X-TRA GUARD™ S**, uses **maltodextrin** as a carrier.
- ✿ Possible declarations include botanical / Rowan Berry extract (*Sorbus aucuparia L.*), plant/fruit extract, natural flavor.\*
- ✿ Self-affirmed GRAS
- ✿ Kosher and Halal certified
- ✿ Available as Organic and Gluten-free

\* Declarations and labeling claims are manufacturer's responsibility

## HOW IS X-TRA GUARD™ MADE?



BERRY  
COLLECTION



HOT WATER  
EXTRACTION



SPRAY DRYING



BLENDING  
STANDARDIZATION



PACKAGING



QUALITY  
CONTROL

# X-TRAGUARD™

A product rich in natural organic acids

## WHY AND HOW TO USE X-TRA GUARD™ ?

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- X-TRA GUARD™ is rich in natural organic acids, in particular sorbic acid
- Sorbic acid was first discovered in the rowan berry in 1800s
- Primarily protects against yeast & mold spoilage in a wide range of applications
- Off-white, easy to handle, free flowing powder
- Overall impact on taste, aroma, texture and color is usually minimal / not noticeable
- Interaction with other ingredients in the recipe usually minimal / not noticeable
- Recommended level of use is very application specific but broadly 1,000 to 8,000 ppm
- Guide: approx. 3 – 3.5 times the level of potassium sorbate that might be considered effective



# APPLICATION TRIAL INDUSTRIAL CAKE

## Trial

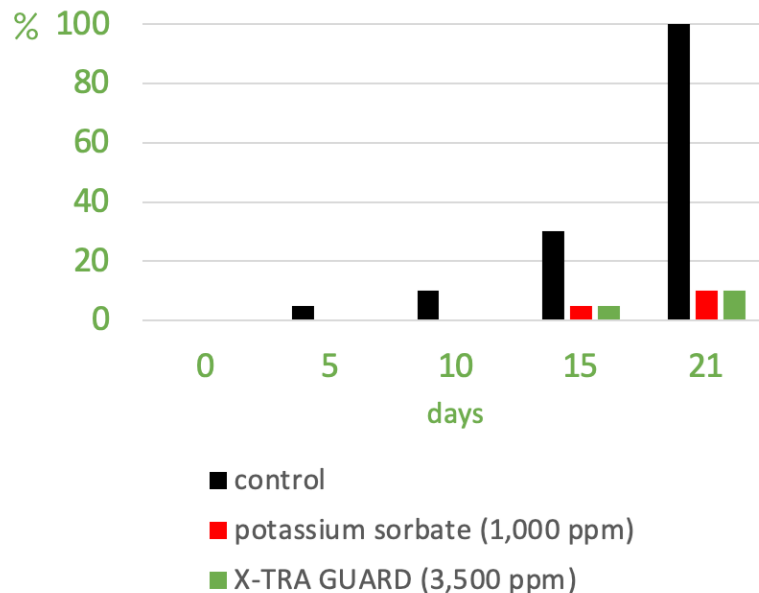
Carried out in-house trials to demonstrate efficacy in cake inoculated a cake (industrial cake recipe with approx neutral pH) with yeast & mould strains and observed their growth over 21 days

## Cake Recipe

Rapeseed oil	21%
Egg	21%
Sugar	19.5%
Starches	16%
Wheat flour	10%
Water	9.5%
Baking powder	1.0%
Others	2.0%

## Shelf-life

Cake trials  
yeast & mold development



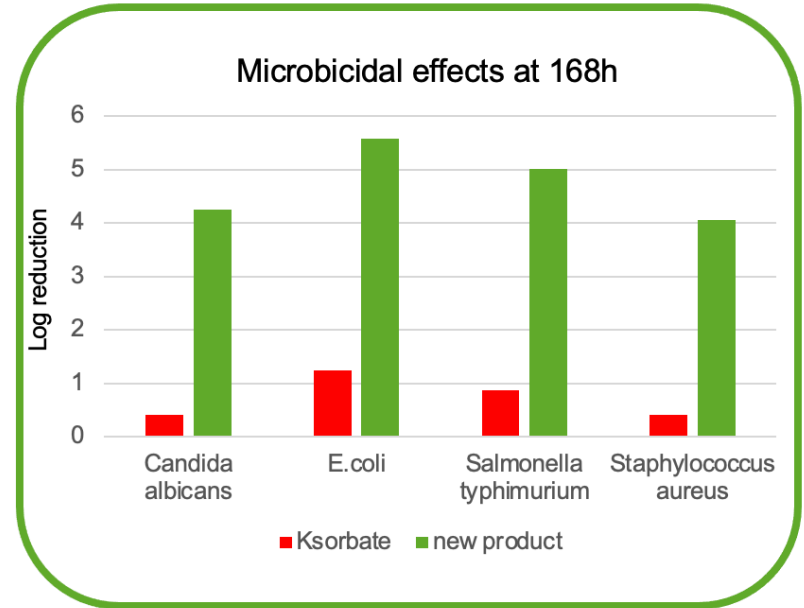
## FURTHER STUDIES & PRODUCTS



- We are carrying out studies at the University of Pavia (Pavia, Lombardy, Italy) in order to demonstrate the anti-microbial activity of various Millbio products
- These studies involve using two types of in-vitro tests and various micro-organisms
- In addition to X-TRA GUARD™ we are studying a new product designed to offer a wider spectrum of anti-microbial functionality i.e. less focused on yeasts & molds and more effective with various bacteria
- Early results are promising on a range of gram positive and gram negative bacteria (4-5 log reduction - 1 week)



UNIVERSITÀ DI PAVIA  
International



# APPLICATIONS & ADDING VALUE

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CAKES / MUFFINS

## Clean up ingredient labels

- ✿ By replacing potassium sorbate and facilitating possible claims on pack



SAUCES / DRESSINGS / DIPS

## For existing clean-label end products

- ✿ Extend the existing shelf-life
- ✿ Facilitate product reformulation to improve the nutritional and/or organoleptic profiles
- ✿ Resolve an existing microbial spoilage issue and/or build in an enhanced inherent microbial robustness
- ✿ Allow the commercialization of new products that could otherwise be unsafe
- ✿ Facilitate reformulation of refrigerated products to make them suitable for ambient storage



JAMS / FILLINGS / CREAMS



TORTILLA / WRAPS / FLATBREADS



CHEESE / PLANT-BASED DAIRY



BEVERAGES

# MARKET EXAMPLES

X-TRAGUARD™

Rowan Berry Extract

Rowan Extract

Rowanberry (Sorbus aucuparia L.) extract

Cake M&S, UK



a red coloured chocolate sponge cake with cream cheese frosting. finished with white cake crumbs

NUTRITION	
Typical values	per 100g
Energy kJ	1796
Energy kcal	427
Fat	22.0g
of which saturates	1.9g
Carbohydrate	50.0g
of which sugars	34.7g
Fibre	<0.5g
Protein	4.7g
Salt	0.56g

Reference intake (adult)  
Energy 8400kJ/2000kcal Fat 70g  
Saturates 20g Sugars 90g Salt 5g

**STORAGE**  
NOT SUITABLE FOR FREEZING.  
For Best Before, see top of pack.  
Store in a cool, dry place. Once opened,  
store in an airtight container.

**INGREDIENTS**  
Sugar - Full Fat Soft Cheese (M&S) (12%) Wheatflour contains Gluten with Wheatflour Calcium Carbonate, Iron, Nickel, Thiamine Postbaked Egg, Edible Oil, Butter M&S Homogenised Caramel, Caramel Syrup - Invert Sugar Syrup - Dried Sterilised Milk - Fat Reduced Cocoa Powder - Cornflour - Rowan Extract - Baking Agents: E455 Sodium Bicarbonate Emulsifier: E471, E475, E481 - Salt - Palm Oil - Colour E120

For allergens see ingredients in bold.  
Not suitable for those with a Nut and Peanut allergy.

Made in the UK with cream cheese from Ireland.

Jam Good Good, Iceland (US)



★★★★★ (1462 Reviews)

### Strawberry Jam 12 oz - Keto Friendly - No Added Sugars

\$9.99

Containing only natural occurring sugars from real fruits, our low-calorie jams have the same sweet taste without the added sugar. Combine our strawberry jam with sweet life syrup, peanut butter & oats for a healthy grab & go breakfast.

- ✓ Made With Natural Sweeteners (Stevia & Erythritol)
- ✓ Keto & Vegan Friendly
- ✓ Suitable For Diabetics
- ✓ Includes Only Natural Occurring Sugars from Real Fruits
- ✓ No Added Sugars
- ✓ Gluten Free
- ✓ Non-GMO

Click here to save up to 40% and create your own Jam Bundle

**INGREDIENTS**

Strawberries (58%), water, sweeteners (erythritol, stevia extract), pectin, rowanberry (Sorbus aucuparia L.) extract, lemon powder, citric acid, concentrate (carrot, blackcurrant), ascorbic acid.

Dressing Picadelli, Sweden

Picadelli Öm oss Sortiment Salladsguide Hitta Picadelli Restauranger Kontakt Kundinlogga

## Caesardressing

Art nr: 12711

**Ingredients:**  
Rapeseed oil, water, EGG YOLK, tarragon, parsley, salt, vinegar, wine vinegar, sugar, onion, corn starch, **rowan berry extract**, white pepper, turmeric, chili, paprika extract, natural flavor, thickener (E412, E415), acidity regulator (E330).

Please, always see the label in store for the most up-to-date list of ingredients.

Picked in: Sweden  
Origin of raw material: Mixed product, different origin of different raw materials

## ADDITIONAL PRODUCTS & SYNERGIES WITH X-TRA GUARD™

### Fermented Flours SPRING X-TRA LIFE™

- Wheat
- Dextrose
- (Brown) Rice Flours \*

### Sourdough SPRING

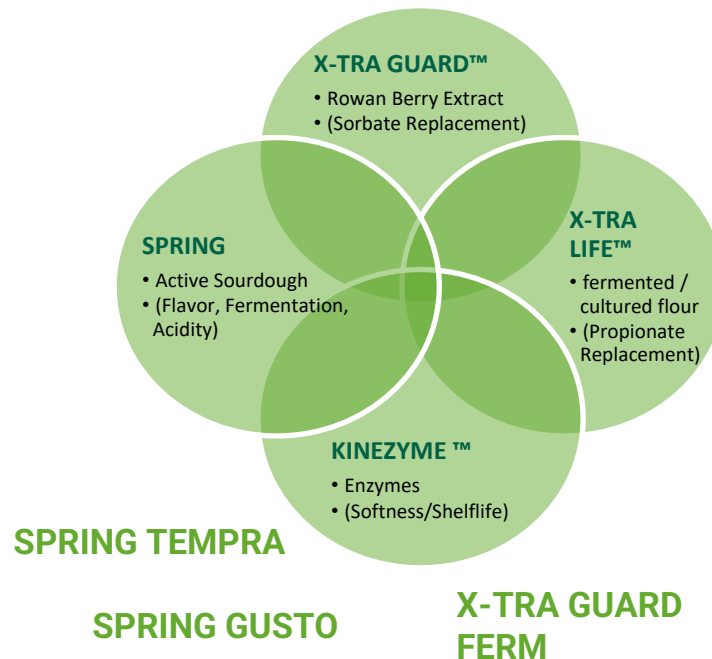
- Authentic Italian
- Natural
- Active
- Tailored Solutions

### Enzymes KINEZYME™

- Pure / Concentrated
- Diluted / Blended
- Specialties / Tailor Made

Manufactured by  
MILLBO Italy

### FERMENTA X-TRA 5



# CONCLUSION

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## X-TRA GUARD™

- ✿ A novel, clean-label, ingredient to help manage the shelf-life (yeast and mold spoilage) in a wide range of food & beverage applications
- ✿ Provides unique and unprecedented solutions for clean-label products
- ✿ Can be used in a synergistic way with other MILLBIO products
- ✿ Research is underway to develop broader-spectrum products able to offer different solutions including the control of various bacteria



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IT ALL  
COMES SO  
NATURALLY



# Thank you!



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