

WHEYBIOTICS

the whey to stay healthy

LBMF - 20/7A/24 fermented whey

"Nuovo ceppo isolato di *Lactobacillus* e i suoi impieghi"



INCI Number: - 2023-11348 Name: Lactobacillus/Whey Ferment Lysate

Market presentation 2024



INSTITUT AGRICOLE RÉGIONAL





The innovative idea

Develop a functional ingredient, starting from Fontina PDO cheese whey, that could contribute directly to the well-being of the human skin.

The new whey processing techniques allow to add value to the milk and support dairy farms of Aosta Valley.

Whey becomes an important starting material, which allows to expand the offer of innovative products in other industrial fields such as the cosmetics industry by offering local companies the opportunity to develop products based on natural active ingredients, highly effective, from raw materials of the territory.

WHY whey.



Because, in addition to high nutritional value derived from milk, whey is an important source of functional molecules such as organic acids and galacto-oligosaccharides (GOS), important prebiotic compounds capable to:

- Have a biological activity on microflora
- Modulate the immune system
- Mitigate the inflammatory skin disorder
- Promote the well-being of the skin



New trends

Fermented beauty products based on active ingredients of natural origin, enhanced by the **fermentation process**.

A practice as old as innovative, ethical, green and sustainable.

The specialized industries in skincare are focusing everything on the processes of natural fermentation to produce new elixirs with booster action, enhanced by this method of extraction of active ingredients that allows a much greater functionality.

From raw materials, chosen for their **natural properties**, the bioactive compounds are released through a fermentation process. Extrapolating the power of natural ingredients by transforming it into **active nutrients** well tolerated by the skin and minimizing the possibility of allergic reactions and skin intolerability.

From Nutraceutical Effect...

Multiple effects on the well-being of the skin after taking GOS with the diet :

the prebiotic on the bacterial flora (growth and activity stimulation) associated with modulation of the immune system of the host (cell migration) and the bioavailability of nutrients with obvious implications in the attenuation of inflammatory states and in the acceleration of repair processes at the skin level.

Presence of bioactive oligosaccharides within the whey:

- oligosaccharides, naturally occurring in milk, produced by the bovine mammary gland
- GOS produced by enzymatic (β -gal) reaction by micro-organisms used in cheese making
- further production of GOS following fermentation of whey



Topical application of cosmeceutical treatment:

- link between skin physiology and microbiota (bilateral crosstalk)
- stimulating commensal bacteria through whey prebiotics
- new perspectives and therapeutic potential of the use of probiotic species protection of the skin and in the stimulation of its metabolism



Enhance the distinctive characteristics of the bacteria naturally present in Aosta Valley dairy products for the development of an active ingredient for the formulation of a cosmetic and/ or a “km0” medical device for the well-being of the skin.

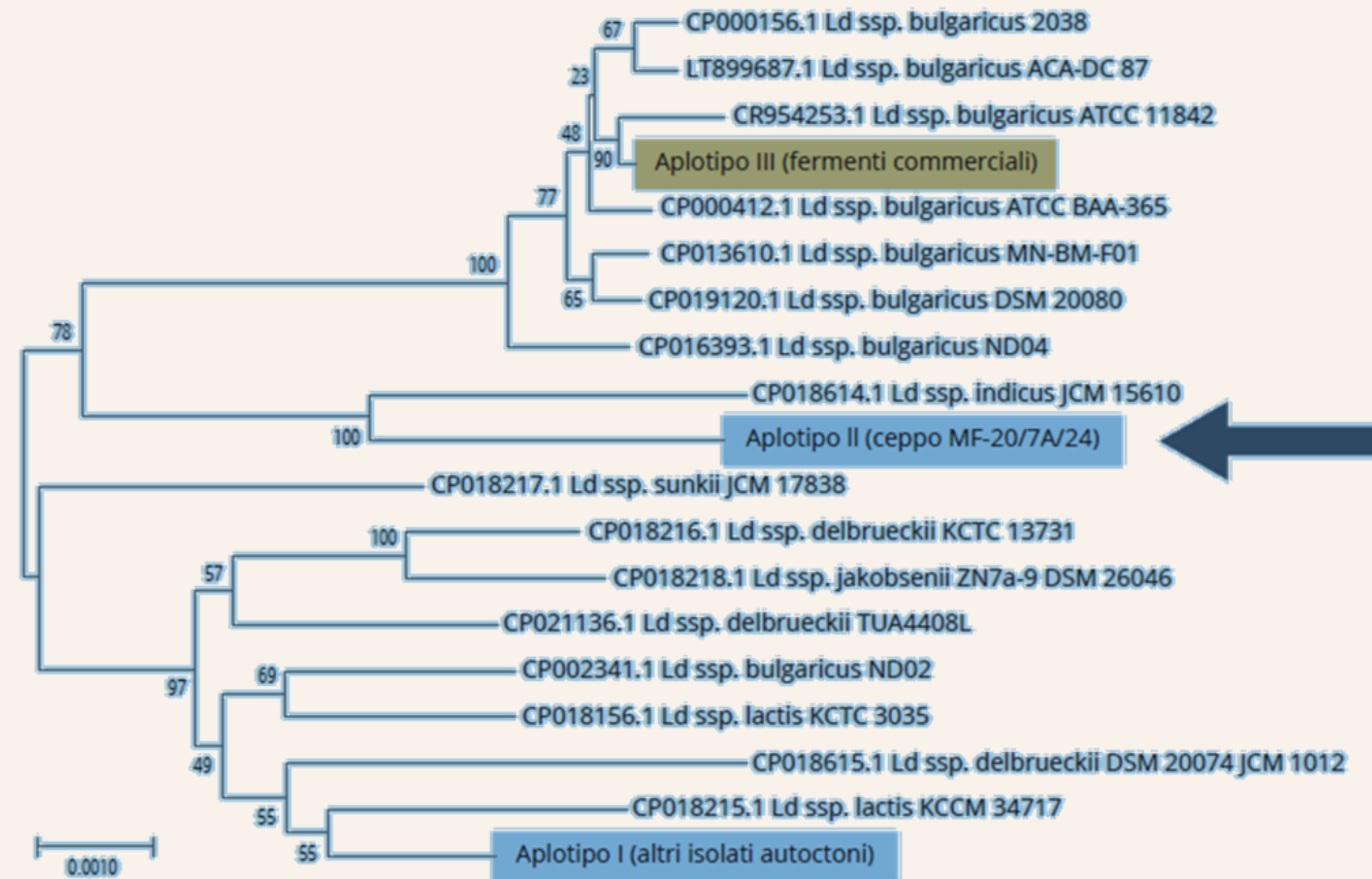
The direct (non-probiotic) effect of GOS on skin keratinocytes and the interaction activity between TLR (Toll-like receptors) as a stimulus of the microbiota against the pathogenic bacteria.



... to the cosmeceutical effect.

LBMF - 20/7A/24

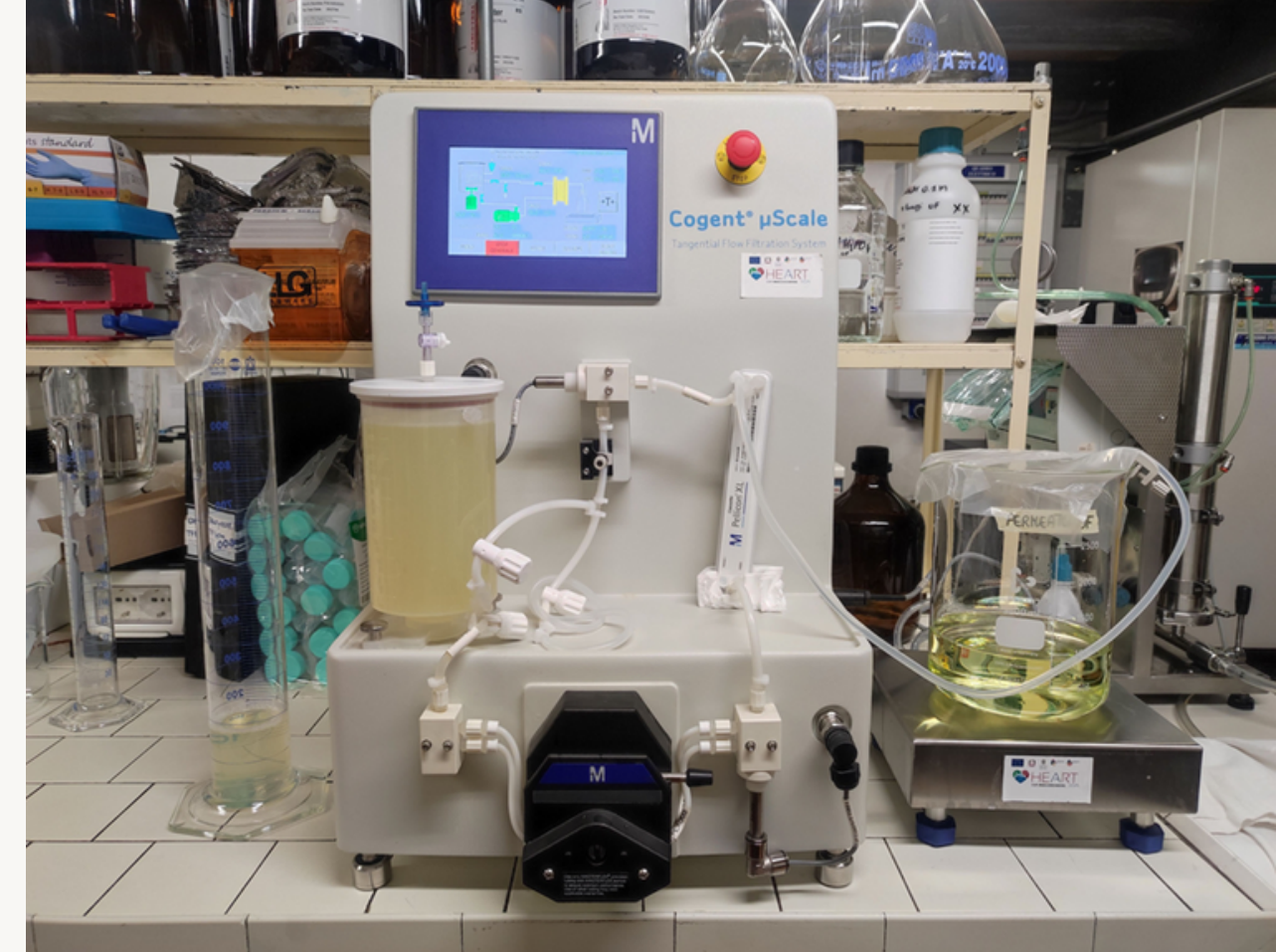
This microorganism, selected in the alpine pastures of the Aosta Valley is genetically different and, unlike from other *Lactobacillus delbrueckii*, is able to use galactose residues.



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The Whey Permeate

i.e. the whey fraction containing potentially bioactive galacto-oligosaccharides(GOS), obtained by ultrafiltration.



FERMENTATION PROCESS

The freeze-dried strain of *L. delbruekii*, ssp unknown, MF-20/7A/24 is used to ferment whey permeate, previously filtered and pasteurized in an autoclave at 90 °C for 20 min.

Fermentation has been carried out for 48 hours at 37 °C, at the end of which, in order to block the process, the permeate was placed in the autoclave at 100°C for 15 min.

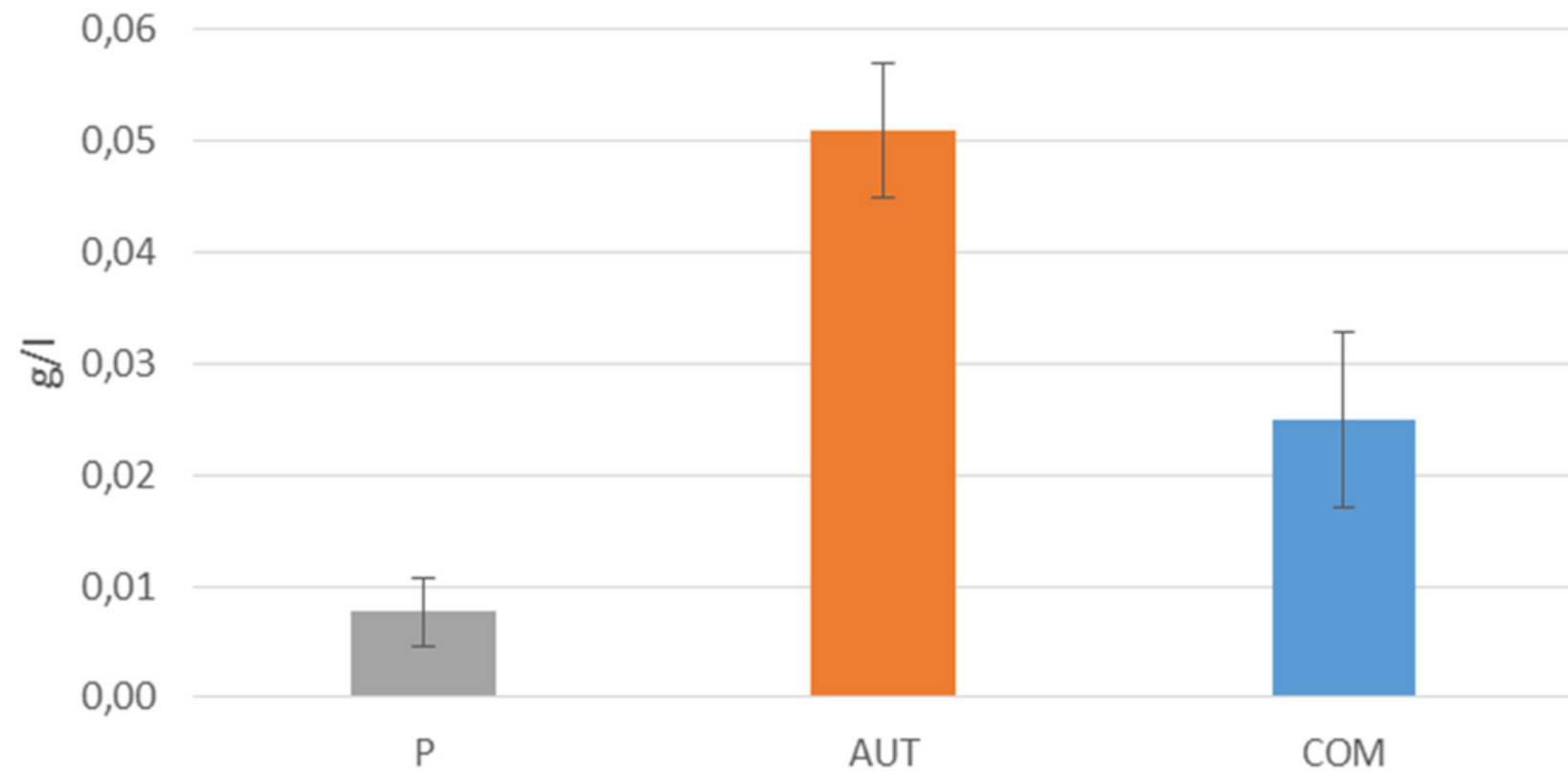
Finally, the fermentation has been microfiltered (0.22 μm) to remove the microbial residue.

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Functional Components

GOS = 2,93 % (w/v) total solids

BUTYRIC ACID



Butyric acid concentration in the fermented whey permeate, by LB MF - 20/7A /24 (AUT), comparing with a not fermented whey permeate (P) and whey permeate fermented by a commercial strain of LB delbrueckii (COM).

Butyric acid is a short-chain fatty acid with numerous known biological activities:

- Immune modulating
- Stimulates the bacterial flora
- Anti-inflammatory
- Anticancer

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In vitro Tests

performed on HaCaT cells, immortalized human keratinocytes that retain the ability to differentiate.



CTRL

TGF BETA

PF

BUT

PF 7 gg

TO

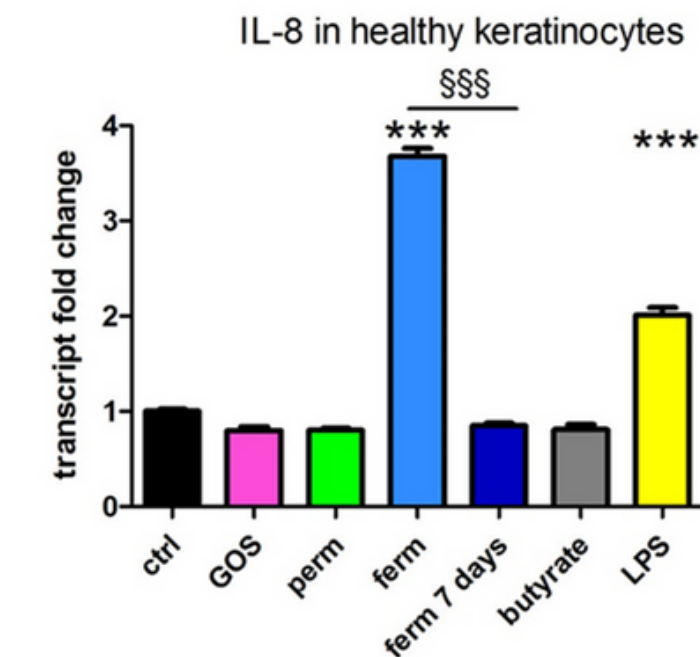


T24h

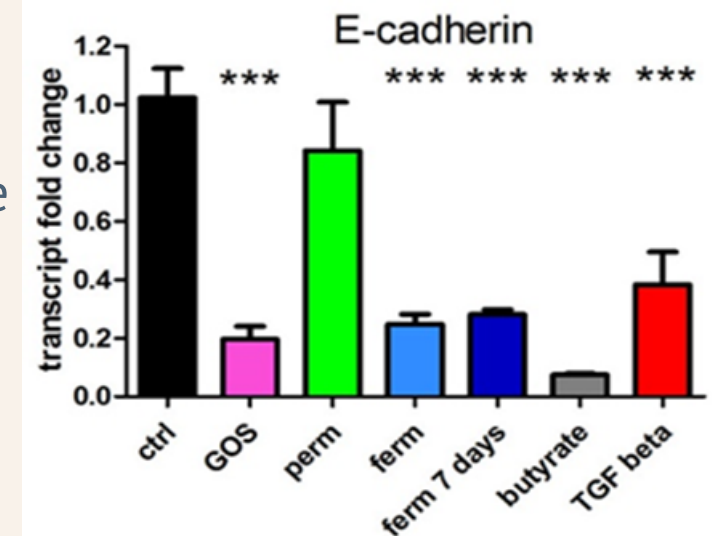


Wound healing test results after 24h of treatment with a positive control (TGF BETA), Wheybiotics (PF), butyric acid (BUT), and in HaCaT cells pretreated for 7 days with Wheybiotics, prior to wound induction (PF 7 days), compared to a negative control (CTRL).

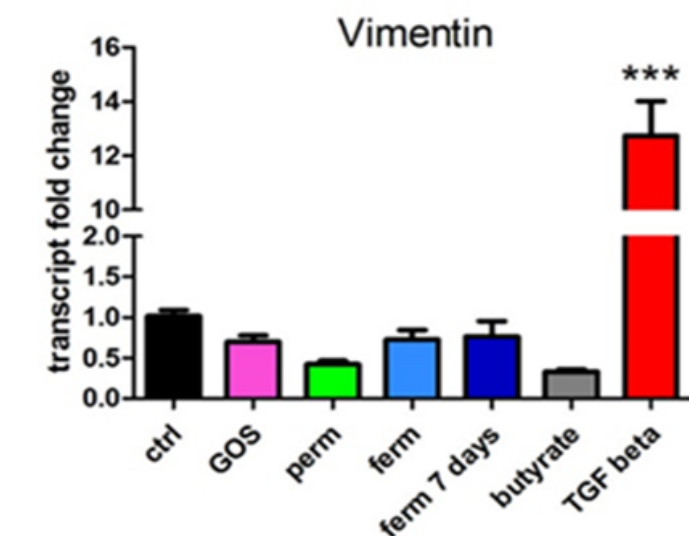
1. Activation of an Inflammatory signal, mediated by cytokins.



2. Keratinocytes migration due to the loss of epithelial intercellular adhesive interactions, mediated by a downregulation of E-cadherin.

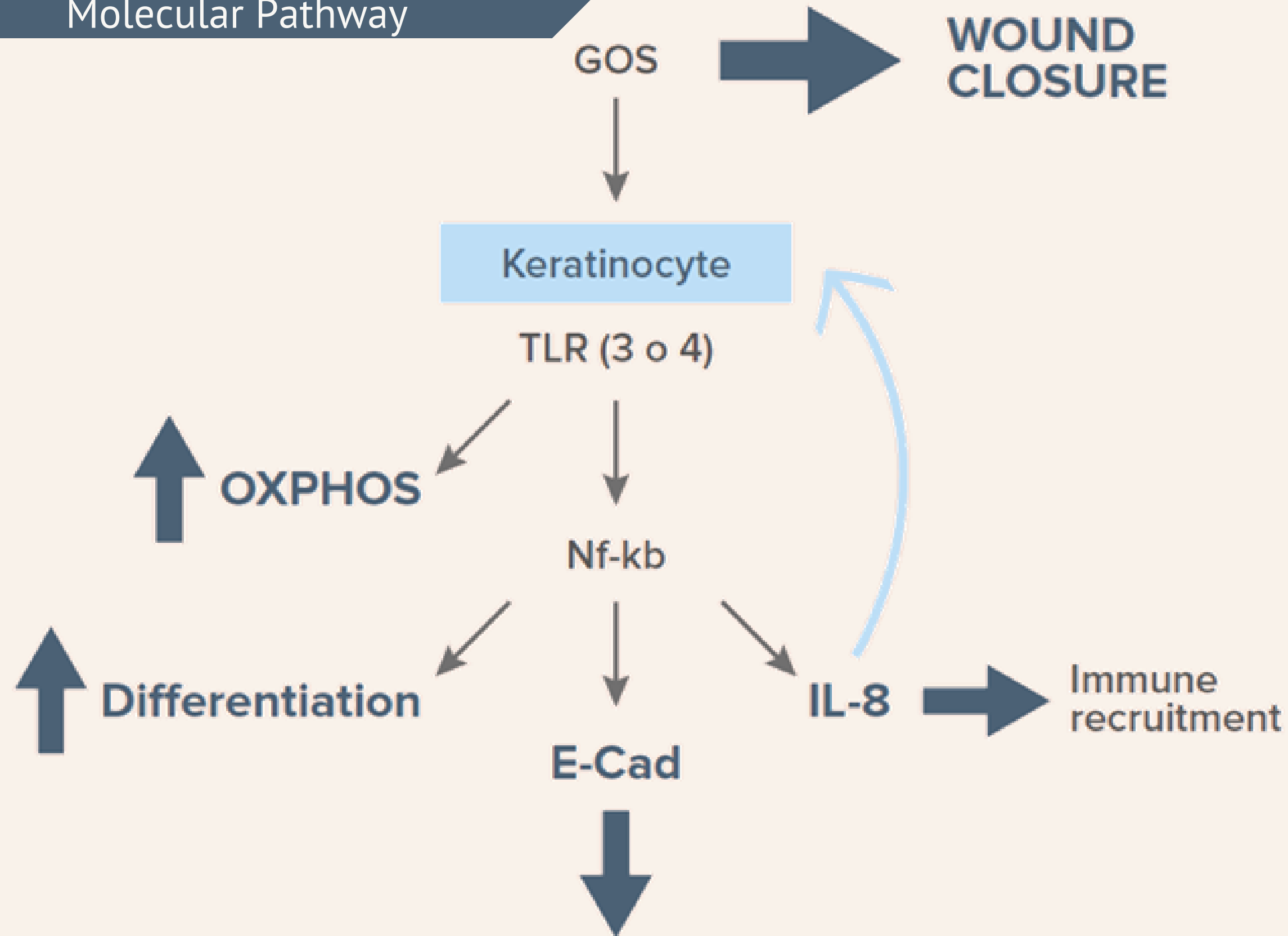


3. No modulation of Vimentin.
Harmful endothelial mesenchymal transition (EMT) is avoided.



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Molecular Pathway



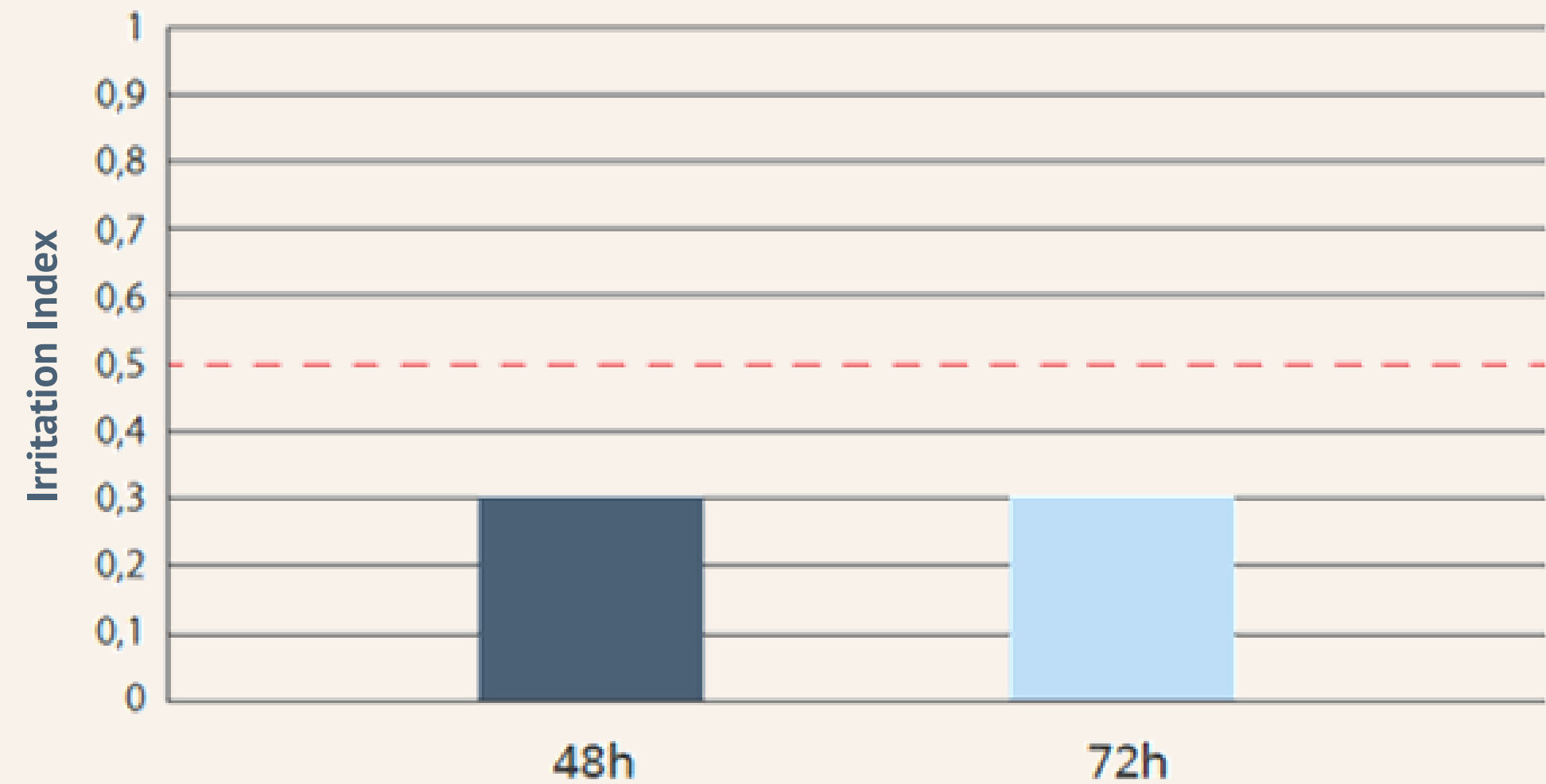
Mechanism of
action of
Wheybiotics.

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In vivo Tests

PATCH TEST

performed on 20 healthy adult volunteers of both sexes who had sensitive skin.



Results highlight that Wheybiotics was not irritating on sensitive skin.



Ministero delle Imprese e del Made in Italy

DIREZIONE GENERALE PER LA TUTELA DELLA PROPRIETÀ INDUSTRIALE - UIBM

ATTESTATO DI BREVETTO PER INVENZIONE INDUSTRIALE

Il presente brevetto viene concesso per l'invenzione oggetto della domanda:

N. 102021000011006

TITOLARE/I:

- REGIONE AUTONOMA VALLE D'AOSTA 10.0%
- ISTITUT AGRICOLE REGIONAL 90.0%

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TITOLO: Nuovo ceppo isolato di Lactobacillus e suoi impieghi

CLASSIFICA: C12N1

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Roma, 17/05/2023

Il Dirigente della Divisione VII

Loredana Guglielmetti



The results of the tests show how the preparation is able to accelerate the healing process of the skin wound through the stimulation of the immune system and the induction of cellular movement.

Italian Patent

Patent n. 102021000011006

More info.

Visit the official website of the Institut Agricole Régional

We invite you to explore the opportunity to integrate WHEYBIOTICS into your product line.

Work with us to harness the potential of this exceptional ingredient and to create cosmetics that respond to the growing needs of consumers for effective, sustainable and science-based products.

For more technical information about WHEYBIOTICS or discuss how our ingredient can adapt to your production and product range, contact us.



SALUTEDERM



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