



PROBIOTIC LACTIC YEAST®

NEW GENERATION PROBIOTIC

KLUYVEROMYCES B0399® (Turval B0399®)

Kluyveromyces marxianus fragilis B0399

«*K. marxianus B0399®* demonstrated a number of beneficial and strain specific properties desirable for application as a probiotic»

Research published by American Society for Microbiology in the scientific journal
Applied Environmental Microbiology, 2012 Feb; 78 (4)

OUR STORY

PRODUCTS

CLAIMS

APPROVALS AND RECOGNITIONS BY NATIONAL AND INTERNATIONAL AUTHORITIES:



Turval is an official supplier of the
Italian Army (*Esercito Italiano*)



Italian Ministry of Health
Ministero della Salute

for animal use:

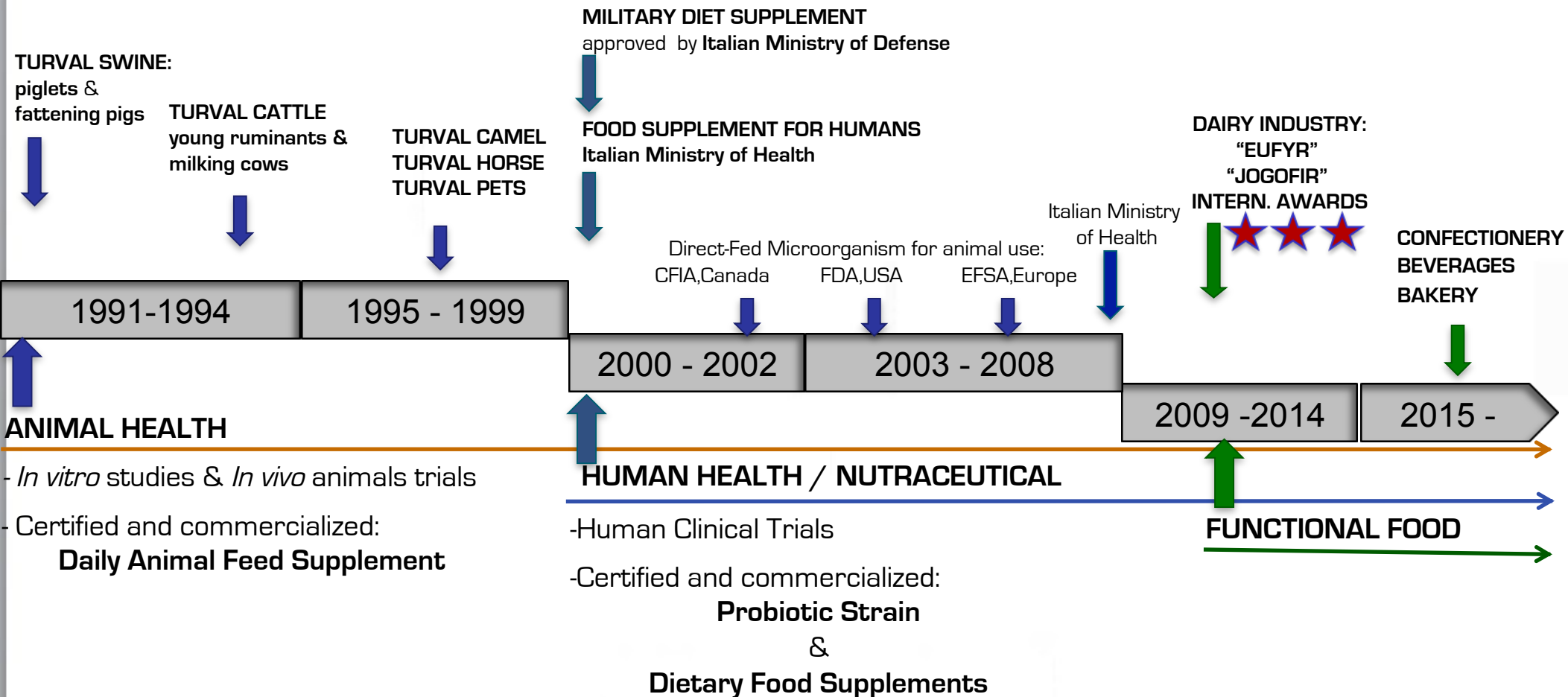




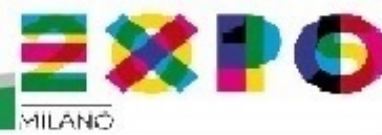
Laboratories Turval Biotechnologies
are located in **Udine**
North East of Italy



Probiotic Lactic Yeast® HISTORICAL EVOLUTION



GLOBAL NETWORK



CANADA

NE; USA

TX, USA

PERU

BRAZIL

ARGENTINA, BRAZIL, URUGUAI

EGYPT

KOREA

CINA

INDIA

IRLAND

SLOVENIA

ROMANIA

CROATIA

SERBIA

SPAIN



TURVAL TEAM

Alessandro Turello, CEO and Co-Founder (Chemical Engineer)

In 1991, he founded the company TURVAL Laboratories as a biotechnological sector of the group Biochemio srl. With the rest of the Turval team he perfected and patented one of the most innovative and effective probiotics for human and zoo-technological use present on the international market. In decades to come eng.Turello supervised numerous research studies which brought multiple national and international approvals



Paolo Valles, Co-Founder (grad. biologist),

By 1992 he joined Turval Labs.as a co-founder, and Project Lead working on enhancement of the probiotic, lactic fermentation by yeasts selected to be used in the animal health; in parallel he was working on development of new biotechnology production techniques (patented). Today he is Technical Director of Livestock Feed Supplement Division and Shareholder.



Ana Backovic, CTO (Biotechnology Engineer, PhD)

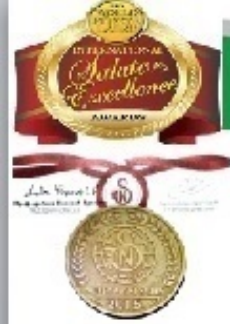
Joined Turval in 2014 as a head of international research project between Turval Laboratories and Faculty of Agriculture, Univ. of Novi Sad (Serbia); As a R&D Project Manager she is responsible for all phases of New Product Development (protocol design, process optimization on small scale, implementation in production scale) to Launch (scientific marketing, support to commercialization); Today she hold the position of R&D director and Scientific Affairs Manager at Turval Labs.



Francesca Cecchini. COO (Food Technologist, PhD)

Joined Laboratories Turval in 2017. She is involved in Quality Control, Regulatory Practices, R&D activities in human area. She is head of different projects regarding new applications of *Kluyveromyces marxianus* B0399®. She is involved in all phases of New Product Development: from protocol design to optimization on industry scale and launch. Furthermore she is responsible for Internal Accounting, Sale Office and Customer Relationship Management holding the position of operating director at Turval Labs.





***KLUYVEROMYCES B0399* (TURVAL B0399®)**

**IS THE SECURE INVESTMENT
because of :**

- SAFE DEPOSIT STRAIN**
- GENETIC IDENTIFICATION AND RECOVERY**
- OFFICIAL APPROVALS**
- STRONG BRAND RECOGNITION**

Kluyveromyces marxianus fragilis B0399

(TURVAL B0399)

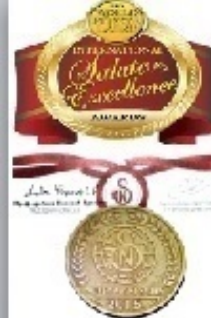
dated April 1999 c/o BCCM/MUCL

(MUCL accession number 55798)

(Belgium Federal Office for Scientific technical and cultural affairs)

The International Belgian Collection of Microorganism
Deposit reference number obtained.

Validity: **worldwide.**



IDENTIFICATION and RECOVERY

1. **Full genome sequencing** of *Kluyveromyces B0399*[®] by **University of Verona** and **IGA** (Applied Genome Institute), Udine.

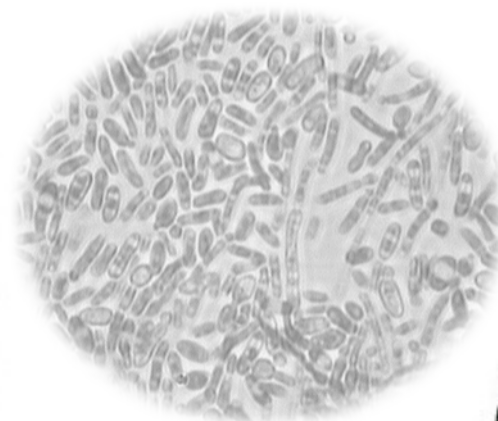
The entire sequence is deposited in NCBI Genome Bank (N. LXZY00000000).



Your investment in this active ingredient is now even more secure!

2. **Vital count** at the microscope with **Burker chamber**.

The method was made official in 2014 during the workshop with Coop Italia, ISS (Istituto Superiore della Sanità), University of Udine, AAT (Spinoff of University of Piacenza), Labomar, Casteggio Lieviti AB Mauri.





APPROVALS by Competent Authority



Italian Ministry of Health: dossier Constituent *Kluyveromyces B0399*: **Approved as a probiotic** by the Ministry of Health (2009) Prot. n.19675. Cfr. Probiotic guides 2005.

European Food Safety Authority (EFSA): The use in piglets feedstuff of the constituent *Kluyveromyces marxianus-fragilis B0399* (TURVAL B0399®). Cfr. Art 5 of the Commission Regulation (EC) No 773/2006 of 22 May 2006 to 2010.



Food and Drug Administration (FDA): Approval of the feed supplement containing the strain *Kluyveromyces B0399* (TURVAL B0399®) and the label: obtained: dated Sept 6th 2005 Ref. DAF 0213.

Canadian Food Inspection Agency (CFIA): Approval of the viable microbial strain *Kluyveromyces B0399* (TURVAL B0399®) obtained on April 19th, 2004.



Food Safety and Standard Authority of India (FSSAI): Approval of the viable microbial strain *Kluyveromyces B0399* (TURVAL B0399®) obtained in March 2022.

Agência Nacional de Vigilância Sanitária – (Anvisa) Brazil Approval of the viable microbial strain *Kluyveromyces B0399* (TURVAL B0399®) obtained in August 2022



Ministry of Agriculture, Livestock and Food Supply (MAPA) Brazil Approval of the viable microbial strain *Kluyveromyces B0399* (TURVAL B0399®) obtained in December 2021

Not only strain identification, but RECOGNISED BRANDS:

Kluyveromyces B0399[®] / Probiotic Lactic Yeast[®]

(various languages and countries)

TRADEMARKS:

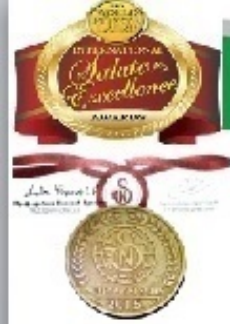
Bioval[®] (various countries)

• Lievilactis[®] (in Italy)

Turval[®] (various countries)

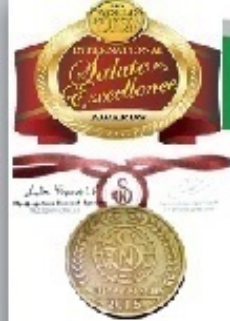
Probiotico amico[®] (various languages and countries)

Lievito amico[®] (various languages and countries)



TURVAL BRANDS and most used KEYWORDS

**improve THE WEB VISIBILITY of
PRIVATE LABEL of a product
containing *Kluyveromyces B0399*®**



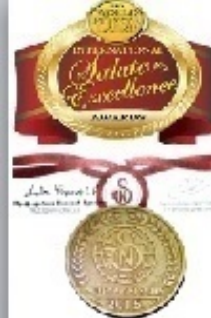
High visibility on the web

(on google searching engine)

Rev. November 2016

Keyword search for trademarks Turval	Number of links
Kluyveromyces B0399®	1590
Yeast B0399®	3160
Probiotic-Lactic-Yeast®	1470
Turval®	90500
Lievito-Lattico-Probiotico®	582











Keyword results highlights the location of the company Turval or one of its products	Subject display	Location on the first page of the search engine
Kluyveromyces	Turval company and site	7
Kluyveromyces	B0399 strain	8
Kluyveromyces fragilis	Kluyveromyces B0399	2 e 3
Kluyveromyces marxianus	Kluyveromyces B0399	4 e 8
B0399	Kluyveromyces B0399	1 e oltre



Keyword on Google:

Kluyveromyces B0399
(First page on Google)



- Candida albicans: Kluyveromyces B0399 active competitor — Turval 
www.turval.com/.../candida-albicans-kluyveromyces-b0399-actively-competes-against-...
Candida albicans: Kluyveromyces B0399 active competitor. Trial#96: In vitro test on the effect of the typified lactic yeast (Kluyveromyces marxianus B0399) on ...
- EXPERTISE: Dosaggio giornaliero di lievito lattico Kluyveromyces ... 
www.turval.com/.../expertise-dosaggio-giornaliero-di-lievito-lattico-... Translate this page
Il numero di cellule vive di Kluyveromyces marxianus fragilis B0399 ... (CFU/persona/die) di Kluyveromyces B0399 sufficiente nell'alimentazione umana può ...
- Probiotic Lactic Yeast® Kluyveromyces B0399 : immune system ... 
www.turval.com/.../probiotic-lactic-yeast-r-kluyveromyces-b0399-immune-system-sti-...
Trial 143: Potential probiotic Kluyveromyces marxianus fragilis B0399 modulates the immune response in Caco-2 cells and PBMCs and impacts on the human ...
- Lactic yeast Kluyveromyces B0399 (Kluyver B0399) on patients ... 
www.turval.com/research/humans_and_nutrition/trials-with-bioval-plus-
Lactic yeast Kluyveromyces B0399 (Kluyver B0399) on patients suffering from irritable colon. Trial#16: The use of Saccharomyces cerevisiae and Kluyveromyces ...
- Full Text - Applied and Environmental Microbiology - American Society ... 
aem.asm.org/content/78/4/956.full
by G Tabanelli - 2012 - Cited by 31 - Related articles
Lactic Kluyveromyces marxianus B0399 Modulates the Immune Response in Human Peripheral Blood Mononuclear Cells and Impacts ...
- Survival of the functional yeast Kluyveromyces marxianus B0399 in ... 
<https://www.ncbi.nlm.nih.gov/pubmed/26547644>
by G Tabanelli - 2016 - Related articles
- Potential probiotic Kluyveromyces marxianus B0399 modulates - NCBI 
<https://www.ncbi.nlm.nih.gov/pubmed/22156412>
ferri - 2012 - Cited by 31 - Related articles
Potential probiotic Kluyveromyces marxianus B0399 modulates the immune response in Caco-2 cells and peripheral blood mononuclear cells ...
- Sintesi pubblicazioni su Kluyveromyces marxianus B0399 - Coop 
<https://www.e-coop.it/.../d6f5f3d0-0c0b-494f-80aa-88bc243b1e5c> Translate this page
Mazzella G, Roda E. Effects of a fermented milk containing Kluyveromyces marxianus B0399 on the immune response in Caco-2 ...
- Coop fa R&S con l'università e lancia due novità a marchio per il ... 
it > News > Retail Translate this page
Il Kluyveromyces marxianus fragilis B0399® è il principale lievito presente nel lievito di origine caucasica noto per le sue ...
- BioVal plus: informative sheet — Turval - Home page Agrilife 
www.agrilife.net/turval/products/humans/bioval-plus-informative-sheet
The Probiotic Lactic Yeas® Kluyveromyces B0399 (Turval B0399®) contained in BioVal PLUS, though presenting similar biological characteristics to active ...

Keyword on Google:

Probiotic Lactic Yeast (First page on Google)



Probiotic Lactic Yeast @ Kluyveromyces B0399 : immune system ... ✓
www.turval.com/.../probiotic-lactic-yeast-r-kluyveromyces-b0399-immune-system-sti...
 Probiotic Lactic Yeast @ Kluyveromyces B0399 : immune system stimulation, gut colonization , bifidobacteria increase and other probiotic effects; Trial 143: ...

PROBIOTIC LACTIC YEAST @ (Turval B0399 @) — Turval ✓
www.turval.com/products/humans/probiotic-lactic-yeast
 PROBIOTIC LACTIC YEAST @ (Turval B0399 @). DOWNLOAD OF FULL TEST DEPLIANT ABOUT ACTIVE INGREDIENT, USERS AND AWARDS

probiotic lactic yeast - Turval ✓
www.turval.com/products/humans/depliant-turval-b0399
 PROBIOTIC LACTIC YEAST@ BROUGHT MULTIPLE AWARDS TO. YOGURTS PRODUCERS FOR THE MOST INNOVATIVE PRODUCT. EUROPEAN AWARD.

Lactic yeast Kluyveromyces B0399 (Kluyver B0399) on patients ... ✓
www.turval.com/research/humans_and_nutrition/trials-with-bioval-plus
 Innovative Probiotic Lactic Yeast for the pharmaceutical, nutritional and agricultural Yogurt with Kluyveromyces B0399: Functional food · Probiotic Lactic Yeast ...

Probiotic Lactic Yeast Biovibrands ✓
www.biovibrands.com/category/blog/probiotic-lactic-yeast/
 Antioxidant Recipes: Don't Choke on Aronia Berries! Aronia Berries have a terrible reputation for tartness—thus the common name, Chokeberry. But they also ...

The Difference Between Probiotic Bacteria and Probiotic Lactic Yeast ... ✓
www.biovibrands.com/the-difference-between-probiotic-bacteria-and-probiotic-lactic-yeast/
 The Difference Between Probiotic Bacteria and Probiotic Lactic Yeast. Probiotic digestive system supplements are on the rise, but unless you have a chemistry ...

Why To Include Probiotic Lactic Yeast in Your Diet Biovibrands ✓
www.biovibrands.com/why-to-include-probiotic-lactic-yeast-in-your-diet/
 Why To Include Probiotic Lactic Yeast in Your Diet. Probiotics are cultures composed of bacteria or yeast that offer a wide range of benefits for your body. Lactic ...

Why You Should Take Lactic Yeast Based Probiotics Biovibrands ✓
www.biovibrands.com/why-you-should-take-lactic-yeast-based-probiotics/
 ... cure for yeast infections · ORAC · pH Levels · Polyphenols · Probiotic Lactic Yeast · Probiotics · Sports · Sports nutrition · Traveler's Diarrhea · What Causes IBS ...

Draft Genome Sequence of the Probiotic Yeast Kluyveromyces ... - NCBI ✓
<https://www.ncbi.nlm.nih.gov> > NCBI > Literature > PubMed Central (PMC)
 by S. Quarella · 2016 · Related articles
 The probiotic lactic yeast Kluyveromyces marxianus fragilis B0399 (TURVAL B0399) is a strain belonging to a species naturally occurring in ...

Probiotic Lactic Yeast Queasy Stomach For – krbo line ✓
www.krbo.info/dh380-probiotic-lactic-yeast-queasy-stomach-for/
 Probiotic Lactic Yeast Queasy Stomach For. Physical exam: Screening is ordinarily done by feeling the prostate by inserting a finger into the rare types of rectal ...



Keyword on Google:

Kluyveromyces fragilis

(First page on Google)

Kluyveromyces marxianus - Wikipedia

https://en.wikipedia.org/wiki/Kluyveromyces_marxianus

Kluyveromyces marxianus is a species of yeast in the genus Kluyveromyces, and is the sexual form (teleomorph) and proper name of Candida kefyr.

yeast kluyveromyces fragilis: Topics by Science.gov

www.science.gov/topicpages/y/yeast+kluyveromyces+fragilis.html

Here, we report of Kluyveromyces marxianus fragilis B0399, the first yeast approved as a probiotic for human consumption not ...

Optimal fermentation conditions for maximizing the ethanol production ...

www.sciencedirect.com/science/article/pii/S0961953411000602

by G Dragone - 2011 - Cited by 45 - Related articles

Kluyveromyces fragilis (Kf1) from the culture collection of the Centre of Biological Engineering, University of Minho (Portugal), was the yeast strain employed in ...

EXPERTISE: Valutazione del lievito lattico Kluyveromyces marxianus ...

www.turval.com/.../expertise-valutazione-del-lievito-lattico-kluyver...

EXPERTISE: Valutazione del lievito lattico Kluyveromyces marxianus fragilis B0399 ai sensi delle linee guida del Min. della Salute Dic 2005 All 1.

Kluyveromyces fragilis as an opportunistic fungal pathogen in man.

www.ncbi.nlm.nih.gov/pubmed/6988992

An immunosuppressed cardiac transplant patient with pulmonary infection due to the yeast Kluyveromyces fragilis is described. Isolation of this fungus from ...

Lipid-Enhanced Ethanol Production by Kluyveromyces fragilis - NCBI

[https://www.ncbi.nlm.nih.gov/NCBI/Literature/PubMedCentral\(PMC\)](https://www.ncbi.nlm.nih.gov/NCBI/Literature/PubMedCentral(PMC))

by JH Janssens - 1983 - Cited by 70 - Related articles

Abstract. The fermentation ability of a strain of Kluyveromyces fragilis, already selected for rapid lactose-fermenting capability, was improved dramatically by the ...

Nutritional profile of food yeast Kluyveromyces fragilis biomass grown ...

<https://www.ncbi.nlm.nih.gov/pubmed/11998844>

by D Paul - 2002 - Cited by 30 - Related articles

Biomass of food yeast Kluyveromyces fragilis (MTCC 188) grown on deproteinized whey supplemented with 0.8% diammonium hydrogen phosphate and 10 ...

Kluyveromyces fragilis - MycoBank

www.mycobank.org/BioMICS.aspx?TableKey=14682616000000067&Rec...

Kluyveromyces fragilis (A. Jörg.) Van der Walt, Bothalia 10 (3): 417 (1971) [MB#316057]

Batch cultivation of kluyveromyces fragilis in ... - Wiley Online Library

onlinelibrary.wiley.com/doi/10.1002/cjce.5450590420/pdf

Kluyveromyces fragilis was cultivated batchwise in an open pond rectangular bioreactor at 30°C, ... fermentation of CW by K. fragilis for the production of the high ...

Kluyveromyces Fragilis as an opportunistic fungal pathogen in man

sabouraudia.oxfordjournals.org/content/18/1/69.abstract

by LI Lutwick - 1980 - Cited by 19 - Related articles

Abstract. An immunosuppressed cardiac transplant patient with pulmonary infection due to the yeast Kluyveromyces fragilis is described. Isolation of this fungus ...



UNIVERSITÀ
DEGLI STUDI
DI UDINE



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA



Univ
Re



WHAT WORLD SAYS ABOUT US...

II
Messaggero Veneto
MERCOLEDÌ 28 GIUGNO 2006

CRONACA DI UDINE

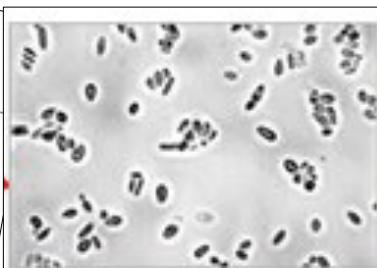
CRONACA DI UDINE

Lievito probiotico regolatore dell'intestino e resistente agli antibiotici è stato brevettato dalla Turval Laboratories con sede nel Parco scientifico alla Zia

**Medicinale naturale inventato a Udine
ha ricevuto il via libera della Sanità Usa**

di GIACOMINA PELLIZZARI

MESSAGGERO VENETO 04/11/08



Novos probióticos no mercado de leites fermentados: agora é a vez das leveduras?

UdineEconomica

UdineEconomica
L'azienda di Pradamano è specializzata nella produzione di prodotti probiotici

Che buono il Parmigiano Reggiano!
Merito anche della Turval

Un integratore friulano per i soldati in Afghanistan

Un probiotico friulano
per l'esercito italiano. Di
recente a Senigallia si so-
no infatti tenuti il decimo
convegno del settore. In
occasione di questo conve-
gno, il professor Roberto
Turval, direttore del
Turval Laboratories, ha
presentato un probiotico a base di
un particolare lievito lattico,
ritenendolo molto più
efficace dei comuni fer-
menti.

**Prodotti Fvg
al servizio
dell'Esercito**

RICERCA

Il lievito "bio-friulano" premiato a Verona

Turval, impresa innovativa
settore delle biotecnologie
dieta al Parco scientifico
...ordine dal 20...

RICONOSCIMENTO INTERNAZIONALE

Yogurt probiotico da guinness

Nato dalla collaborazione tra Coop e Parco scientifico di Udine

UDINE

Uno yogurt contenente un probiotico studiato e brevettato al parco scientifico di Udine ha ottenuto il "gold to excellence awards" della marca del distretto, svoltasi ad Amst

Premio allo yogurt bio friulano

Lo yogurt prodotto con lievito probiotico Turval B0399 nato nel territorio - sottolinea il presidente della Fao - di Friuli innovativo e di una tradizione che ha trasferito i suoi valori nel mondo.

Si tratta del successo di un territorio - sottolinea il presidente della Fao - di Friuli innovativo e di una tradizione che ha trasferito i suoi valori nel mondo.

UDINETODAY

A Expo 2015 anche Eufyr, lo yogurt nato al parco scientifico e tecnologico di Udine

NOVI PROBIOTICI NA TRŽIŠTU FERMENTIRANOG MLEKA

Redje na kvasce:

VELIKA vest je da na srpsko tržište izlazi **probiotski fermentisani mlečni napitak** nove generacije, koji sadrži žive ćelije **probiotskog mlečnog kvasca*** (*Kluiveromyces marxianus fragilis* B0399).

Probiotici su živi mikroorganizmi koji, pri redovnom unosu u adekvatnoj dozi, rade



New England Journal of Large Animal Health

VOL. 1 NO. 1
OCTOBER 2001

48 **7FRIULI BUSINESS**

AZIENDE TERZIARIO

Probiotici anche per intolleranti

TURVAL - LA MAPPATURA DEL DNA DEL LIEVITO BREVETTATO
AIUTERÀ L'AZIENDA UDINESE A SVILUPPARE PRODOTTI
PER LE PERSONE CHE NON DIGERISCONO IL LATTOSIO

TURVAL 5 CAMELIDS DAILY

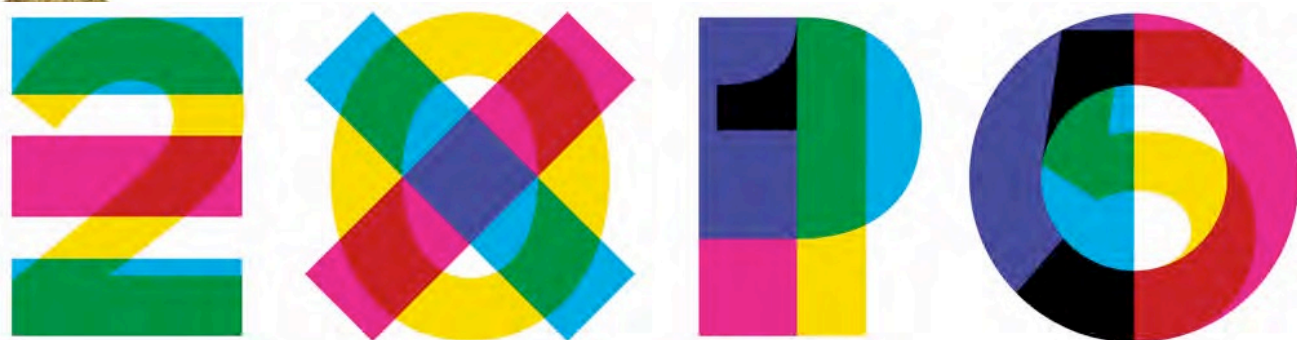
"I have been studying Turval 5 Camelids Daily for use in llamas and alpacas for the past 6 months. This product is a combination of probiotic organisms and microminerals with the goal to improve digestion by stabilizing the fermentation process."

PROBIOTIC LACTIC YEAST® BROUGHT INTERNATIONAL AWARDS TO YOGURT PRODUCERS FOR QUALITY AND INNOVATION

EUROPEAN AWARD

IN 2014 "**EUFYR** (POMEGRANATE)", WITH **PROBIOTIC LACTIC YEAST®**,
PRODUCED BY ONE OF THE BIGGEST ITALIAN RETAILERS, COOP – ITALY,
WON PRESTIGIOUS **PLMA'S INTERNATIONAL**
"SALUTE TO EXCELLENCE" AWARD,
WINNING AMONG
210 PRODUCTS BY 45 RETAILERS
FROM 16 EUROPEAN COUNTRIES





MILANO



EUFYR [COOP, ITALY], THE FIRST COMMERCIALISED PROBIOTIC YOGURT CONTAINING *KLUYVEROMYCES B0399*[®], **WAS CHOSEN FOR** THE UNIVERSAL EXHIBITION **EXPO 2015** AS AN EXAMPLE OF LEADING INNOVATION IN FUNCTIONAL DAIRY PRODUCTS.

NEW GENERATION PROBIOTIC YOGURT
WITH **PROBIOTIC LACTIC YEAST**[®] COOP ITALY



EASTERN-EUROPEAN AWARD

IN 2015 **KLUYVEROMYCES B0399®** BRINGS THE SECOND

**INTERNATIONAL AWARD TO THE INNOVATIVE
PROBIOTIC FERMENTED MILK BEVERAGE "JOGOFIR",**

PRODUCED BY THE AGRICULTURAL COMPANY

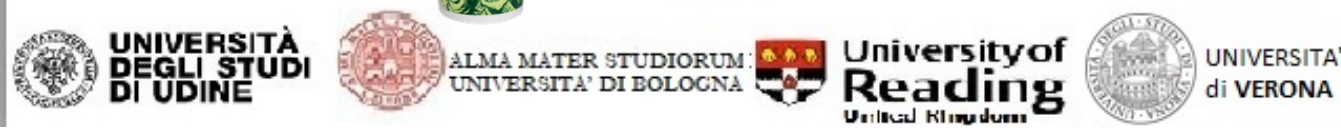
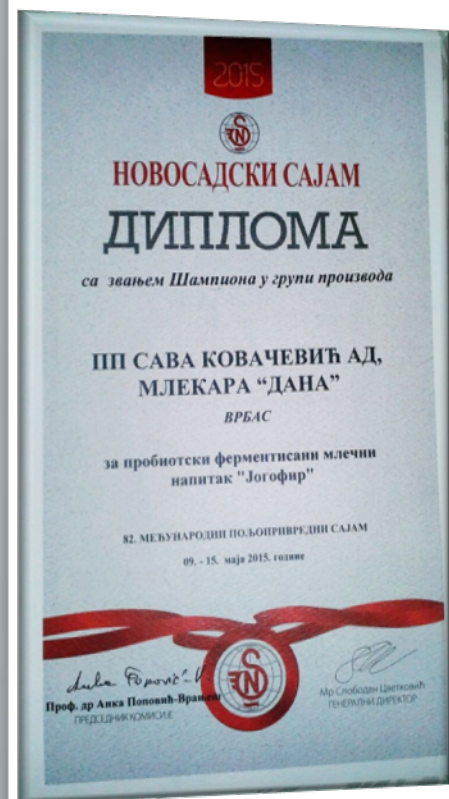
"SAVA KOVACEVIC - DAIRY DANA" (SERBIA)

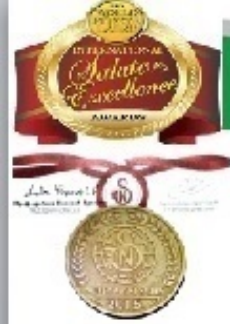
82nd INTERNATIONAL AGRICULTURAL FAIR

OF NOVI SAD, SERBIA

NOMINATED **JOGOFIR** THE

**"CHAMPION OF QUALITY AND
INNOVATION".**



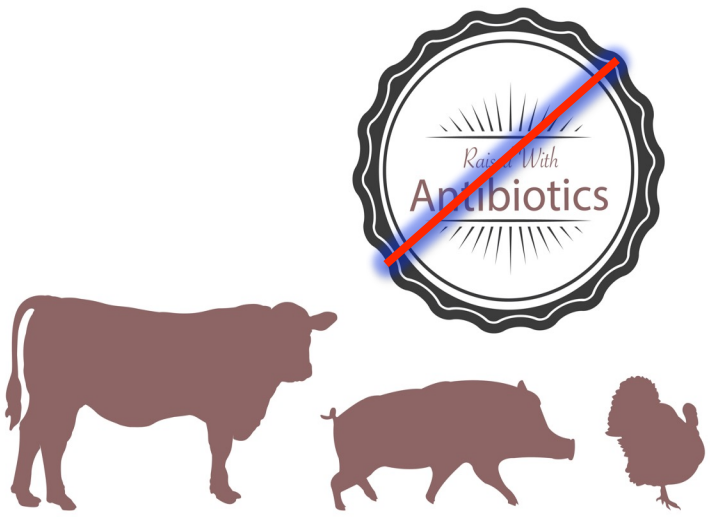


Kluyveromyces B0399 **(TURVAL B0399®)**

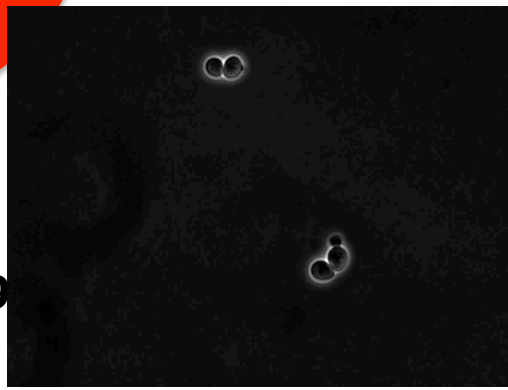
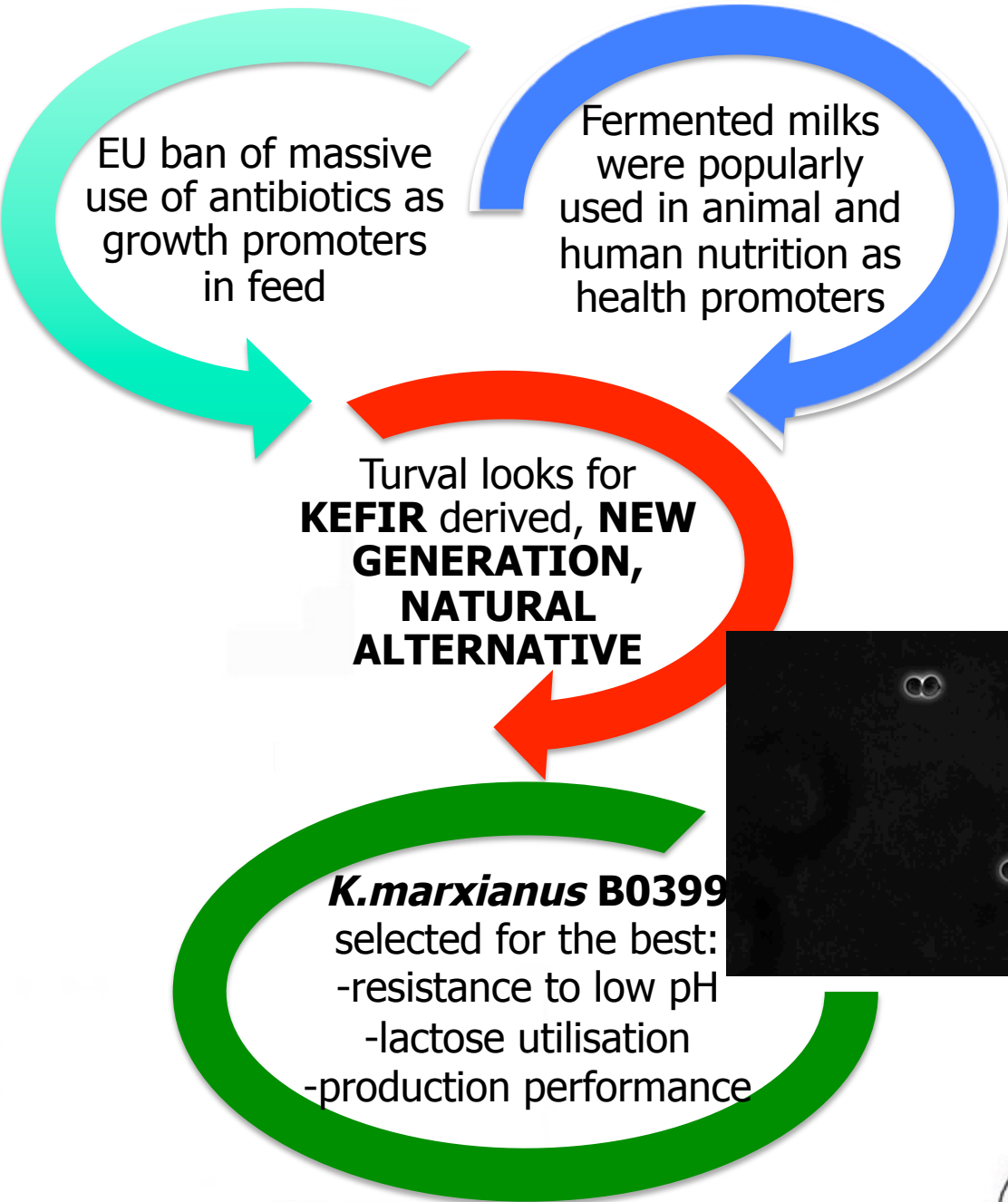
chosen by Italian Ministry of Defense
(prot. n. 054236)



*Turval is an official supplier of the
Italian Army (**Esercito Italiano**)*



Goatskin bag for carrying milk and culturing kefir in the Caucasus



Why is K-B0399 new generation probiotic?

**BCTERIAL
PROBITOTICS**

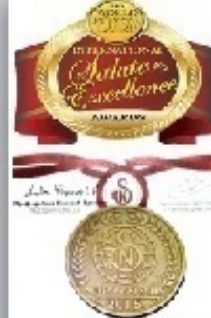
Lactobacillus Acidophilus LA5
Lactobacillus Rhamnosus LGG
Bifidobacterium lactis BB12

Streptococcus Thermophilus
Bacillus Coagulans
Pediococcus Acidlacti
Lactobacillus sp.
Bifidobacterium sp.

Kluyveromyces marxianus fragilis B0399
PROBIOTIC LACTIC YEAST®

**PROBIOTIC YEAST
S. BOULARDII**

- **YEAST** : eukaryotic cell – more complex than procariotes (bacterial probiotics):
 - **resistance to gastric conditions (low pH)**
 - **resistance to antibiotics**
- **LATTIC**: **lactate producer**; digest lactose by means of **B-galactosidase** (only 2% of all yeast species have this capacity)
- **PROBIOITIC**: has number of beneficial and strain-specific properties ensuring **GUT** and **IMMUNE HEALTH** with only **10 mln UFC/die**



It is different from all others because:

TURVAL B0399 IS A YEAST PROBIOTIC

- ✓ eukaryotic cell
- ✓ resistant to gastric environment
- ✓ naturally resistant to antibiotics



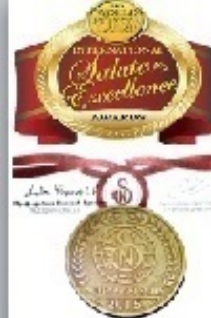
**PROBIOTIC
BACTERIA**

TURVAL B0399 IS A LACTIC YEAST

- ✓ enzymatic profile: **B-galactosidase** (lactose), **inulinase** (inuline, FODMAPs etc), **glucanase** (glucans)
- ✓ present in common milk products (kefir, cheese, fermented milks) as well as **human mycobiota** (*N.Gouba et al., 2015*)
- ✓ considered safe by **GRAS** and **EFSA safety system**, **without any exception** (*S.boulardii* is contraindicated for patients of frail health, as well as for patients with a central venous catheter; *EFSA Panel 2007*)



**SACCHAROMYCES
BOULARDII**



It is different from all others because:



KB0399 is a **Probiotic**:

«Live microorganisms which when administered in adequate amounts confer a health benefit on the host» (FAO e WHO: *Health and Nutritional Properties of Probiotics in Food 2001*; Ministero della Salute: *Linee Guida su Probiotici e Prebiotici*, revisione maggio 2013)

Symbiotic

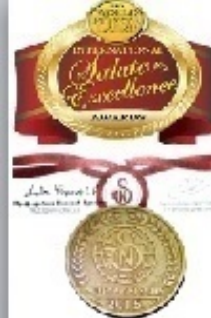
KB0399 is a source of **Prebiotic** (β -1,3/1,6-glucans):

"A prebiotic is a non-viable food component that confers a health benefit to the host associated with modulation of the microbiota" (FAO - *Meeting Report: Prebiotics*"; Roma, Settembre 2007)

KB0399 also acts as a **Postbiotic**:

Paraprobiotic paradox: "Live and dead cells are biological response modifiers" (Adams CA. *Nutr Res Rev.* 2010 Jun;23(1):37-46)

"Postbiotics are products based on inactivated probiotic cells / cell fractions with or without metabolites produced by these that have beneficial effects on health" (*The International Scientific Association of Probiotics and Prebiotics - ISAPP*)



THE ACTIVE INGREDIENT

Lactic yeast *Kluyveromyces* B0399®

is a SYMBIOTIC,

ALLY YEAST of HUMAN MICROBIOME

SCIENTIFICALLY PROVED BIOFIDOGENIC EFFECT ("prebiotic effect"):

It increases the number of endogenous Bifidobacteria, considered part of the first defense line of our immune system) (*Trial 143: Maccaferri et al., 2012*), WITH ONLY:

10 MILIONI UFC/DÌE

EFFICIENT AT A VERY LOW DOSAGE, WHICH DOES NOT ALTER THE NATURAL MICROBIOM BIOSTRUCTURE! (*Maccaferri et al., 2012*)

Dosage approved by Italian Ministry of Health in 2009



Italian Ministry of Health
Ministero della Salute

Research activity and scientific evidence

Multiple beneficial, strain-specific properties of *Kluyveromyces* B0399, the MOA and exclusive manufacturing process have been supported by vast **research activity**, animal efficacy trials, clinical studies and production tests

>200 STUDIES

>30 SCIENTIFIC COLLABORATIONS

Most work has been evaluated by National and International **scientific commissions.**

The most relevant studies are reported in the next slides.

Scientific collaborations with universities & academic institutes

International Collaborations:



- **Reading University (UK)**
Department of Food and Nutritional Science
- **Ohio State University (USA)**
- **North Carolina State University (USA)**
- **University of Nevada, Las Vegas (USA)**
School of Life Sciences and
Nevada Institute of Personalized Medicine
- **University of Novi Sad (Serbia)**
Faculty of Agriculture, Dairy Dept.
- **University of Nebraska (USA)**
- **Nairobi University (Kenya)**
Institute of Technical Nutrition

National Collaborations:



- Scientific Park – (Italy):** Institute IGA
ASA Azienda Speciale
Genomic Ambiente (CCIAA-UD)
Transactiva Srl.
- **Verona University (Italy):**
Department of Biotechnology
- **Udine University (Italy):**
Animal Production Dept, Foods Sciences Dept.
- **Perugia University (Italy):**
Agro-Biotechnologies Dept.
- **Bologna University (Italy):**
Department of Pharmaceutical Sciences
- **AREA Science Park – Trieste**

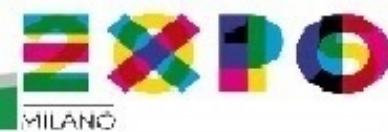
Research monogastric animals



Trial n°	Monogastric animal species	Purpose	Authors	Institute	Place	Evaluated by
09	Horse	Efficacy of different european probiotics in sport horses with intestinal colics or disfunctions	Ferrari	Practitioner	Watten Austria	US-FDA(6)
11	Piglets after weaning	Auxinic effect of <i>Kluyveromyces m/f</i> B0399 on piglets after weaning	Zarabara	Allevamento Foscchia	Udine – Italy	Italian Ministry of Health IT(1), EFSA(4), US-FDA(6)
12	Piglets pre weaning	Auxinic effect of <i>Kluyveromyces m/f</i> B0399 on piglets during pre-weaning	Zarabara	Allevamento Foscchia	Udine-Italy	Italian Ministry of Health IT(1), EFSA(4), US-FDA(6)
14	Horses	Effect of <i>Kluyveromyces m/f</i> B0399 on horses with intestinal disorder	De Logu, Chierchi	Istituto d'Incremento Ippico della Sardegna	Sassari – Italy	US-FDA(6)
15	Piglets	Experimental comparison with other european probiotics of the auxinic effect	A.Orlandi	Vitamex	Belgium	
17	Horses	Effect of <i>Kluyveromyces m/f</i> B0399 on the environment of large colon	Lowell, Smalley	H&S Lab H & S Lab Inc.	Omaha, Nebraska – USA	US-FDA(6)
21	Horses	Effect of <i>Kluyveromyces m/f</i> B0399 affected by intestinal colic: Preliminary clinical	Gerald Huff	Practitioner	Las Vegas nevada – USA	US-FDA(6)
27	Dogs (Huskies)	Feeding trial with <i>Kluyveromyces m/f</i> B0399 on dogs (Huskies).	Khatchikian	International School of Mushing	Tarvisio (Udine) – Italy	
35	In-vitroTest	Comparative experimentation in relation to the efficacy of probiotics in monogastric intestine (abstract)	P. Susmel B. Stefanon	Dept. of Animal Science - University of Udine	Udine – Italy	Italian Ministry of Health IT(1), EFSA(4), US-FDA(6)
38	Expertise	Advantages of coupling brewer's yeast with <i>kluyveromycesmarxianus/fragilis</i> B0399	Bruschi	ICGEB International Centre for Genetic Engineering and	Trieste- Italy	Italian Ministry of Health IT(1), EFSA(3), US-FDA(6)



Research monogastric animals



Trial n°	Monogastric animal species	Purpose	Authors	Institute	Place	Evaluated by
51/A	Piglets	Effect of DOSAGE of <i>Kluyveromyces m/f B0399</i> on performance and tolerance of piglets up to 25kg.	Bosi	DIPROVAL University of Bologna	Bologna – Italy	Italian Ministry of Health IT(1) EFSA(3) US-FDA(6)
51/B	Piglets	Intestinal pH and feces <i>E. coli</i> occurrence of weaned piglet receiving <i>Kluyveromyces m/f B0399</i>	Bosi	DIPROVAL University of Bologna	Bologna – Italy	Italian Ministry of Health IT(1) EFSA (3) US-FDA(6)
57	Horses	Evaluation of Probiotic effect of Lactic Yeast <i>Kluyveromyces fragilis B0399</i> in adult horses. Variation of large colon pH.	Susmel, Stefanon,. Del Savio,. Boccalon	Scuderia Adrian - Cervignano Scuderia Adrian – Perteole Dept. of Animal Science – University of Udine	Perteole (Udine) – Italy	US-FDA(6)
67	Horses (stallions)	Sperm quality of stallion receiving alive Lactic yeast <i>Kluyveromyces B0399</i>	Rassu , Cannas,. Cherchi,. Delogu,. Enne	Dept. Of Animal Sci. - University of Sassari Istituto d'Incremento Ippico della Sardegna, Ozieri	Ozieri (Sassari) - Italy	US-FDA(6)
71	Piglets	Performances of weaned piglets <i>Kluyveromyces m/f B0399</i>	Bosi, Bonetti	DIPROVAL - University of Bologna GIMA SpA Feed manufacturer	Rubiera (Teramo) - Italy	EFSA(3) US-FDA(6)
79	Piglets	Effects of <i>Kluyveromyces m/f B0399</i> in the diet of the weaned piglet. Tolerance test and effects on the intestine microorganism.	Bosi	Experimental Zootechnical Structure of University of Bologna –DIPROVAL	Bologna – Italy	Italian Ministry of Health IT(1) EFSA(3) US-FDA(6)
84	Test	Resistance to antibiotics of the additive <i>Kluyveromyces m/f B0399</i>	Riul-Vaughan	Dept. of Biology Biotechnologies University of Perugia	Perugia - Italy	EFSA(3) US-FDA(6)
136	piglets	Efficacy of Turval B0399 (<i>Kluyveromyces m/f B0399</i>) on the growth and conversion index on weaned piglets	Renzo Bonetti	Bologna Vet Association - Local Health Ministry (USL) n 24	Bologna	EFSA(5)



Trial n°	Polygastric animal species	Porpouse	Authors	Institute	Place	Evaluated by
43	Milking cows	Preliminary experimental evaluation of growth of productivity resulting from administration of Turval 4 cattle probiotic to milk.	Paolo Valles, biologist Dr. Cesare Lui, Dr. Vet. Med	Farm in the Province of Cremona	Cremona - Italy	US-FDA(6)
44	Fattening calves	Experimental evaluation of improving effect of Turval 4 cattle probiotic on fattening process yield.	Paolo Valles Dr. Cesare Lui	Farm Arrighini	Calvatone CR, Italy	US-FDA(6)
46	Milking cows	Effects of Turval 4 cattle (probiotic) on quality and quantity of milk production.	Paolo Valles Dr. Cesare Lui	Farm in the Province of Cremona	Cremona - Italy	US-FDA(6)
65	Milking cows	Experimental evaluation of improvement in quality and quantity of milk production resulting from administration of two different probiotics: Saccharomyces cerevisiae (Yea-Sacc) vs. Kluyveromyces B0399 (TURVAL 0 ^{sp/5})	Paolo Valles Dr. Cesare Lui	Farm in the Province of Cremona	Cremona - Italy	US-FDA(6)
200	Milking cows	Experimental evaluation of effect of TURVAL 0 ^{sp/50} on the quality and quantity of produced milk on the territory of Vojvodina (northern Serbia)	Ana Backovic, PhD Dr.Vet.med Tanja Roganovic prof Anka Popovic Vranjes, PhD	Farm Sava Kovacevic	Vrbas, Serbia	US-FDA(6)
In vitro studies/ ongoing	Artificial rumen	Influence of feeding Kluyveromyces B0399 (TURVAL 0 ^{sp/50}) on ruminal pH	prof.Piero Susmel, PhD	University of Udine, Animal production Dept.	Udine, Italy	US-FDA(6)

Research humans:



Trial n°		Porpouse	Authors	Institute	Place	Evaluated by
16	Human	Trials with lactic yeast <i>Kluyveromyces</i> B0399 on irritable colon	Andreoli, Sepulcri	Dep. Gastroenterology - Hospital S. Maria della Misericordia;	Udine – Italy	Italian Ministry of Health IT(2)
35	In-vitroTest	comparative experimentation in relation to the efficacy of probiotics in monogastric intestine (abstract)	P. Susmel B. Stefanon	Dept. of Animal Science - University of Udine	Udine – Italy	Italian Ministry of Health IT(1) EFSA(4) US-FDA(6)
38	expertise	advantages of coupling brewer's yeast with <i>kluyveromycesmarxianus/fragilis</i> B0399 as a human dietary supplement	Bruschi	ICGEB International Centre for Genetic Engineering and Biotechnology	Trieste- Italy	Italian Ministry of Health IT(1) EFSA(3) US-FDA(6)
75	Human	Effects of <i>Kluyveromyces m/f</i> B0399on patients with atopic dermatitis : Preliminary results	Tulli	Dept. of fDermatology, University “G. d’Annunzio”	Chieti – Italy	Italian Ministry of Health IT(1)
84	Test	resistance to antibiotics of the additive <i>Kluyveromyces m/f</i> B0399	Riul-Vaughan	Dept. of Biology Biotechnologies University of Perugia	Perugia - Italy	EFSA(3) US-FDA(6)
96	Human	In vitro test <i>Kluyveromyces m/f</i> B0399 vs <i>Candida albicans</i>	Cettolo, Riul-Cescutti	Laboratorio Specializzato di Microbiologia dell'ASA - CCIAA di Udine	Udine – Italy	Italian Ministry of Health IT(1)
109	expertise	Dosaggio giornaliero di lievito lattico <i>Kluyveromyces</i> B0399 nell'alimentazione umana	Dr Paolo Valles (1) – Dr.ssa Alessia Lugano(2) -	(1)Biologo (2)scienze produzione animale	Trieste(1) (2)(S. Giovanni al Natisone (UD) Italy	Italian Ministry of Health IT(2)
125	Human (fermented milk)	Evaluation of the effects of a fermented milk containing <i>Kluyveromyces marxianus fragilis</i> B0399 in patients suffering from Irritable Bowel Syndrome —a randomized clinical study controlled with placebo	Prof. Enrico Roda Prof. Gianluca Cornia, Dr. Andrea Lisott	Bologna University – Italy)	Bologna- Italy	



Trial n		Porpouse	Authors	Institute	Place	Evaluated by
129	Human	Verifica della presenza di Candida albicans nel tratto gastrointestinale in soggetti sani, in seguito all'assunzione di lievito lattico <i>Kluyveromyces marxianus fragilis</i> B0399, mediante l'esame delle feci.	Prof. Giorgio Mustacchi *1; Dott.ssa Teresa De Monte*2	*1 (Centro Oncologico Azienda per i Servizi sanitari N° 1 – triestina, Università degli Studi di Trieste): *2 medico chirurgo Artegna (UD) .	(*1)Trieste (*2)Artegna (Udine) Italy	
130.1	Human	Capacity of colonization of the gastrointestinal tract in healthy subjects, after the utilization of the lactic yeast <i>Kluyveromyces marxianus fragilis</i> B0399, through examination of the feces.	Prof. Giorgio Mustacchi *1; .	Centro Oncologico Azienda per i Servizi sanitari N° 1 – triestina, Università degli Studi di Trieste):	Trieste - Italy	Italian Ministry of Health IT(2)
132	Human	Clinical results of treatment with the lactic yeast <i>Kluyveromyces m/f</i> B0399 for IBS	Sandro Andreoli*	Endoscope specialist at the S.Camillo Hospital, Treviso	Treviso -Italy	Italian Ministry of Health IT(2)
138	Human (fermented milk)	Administration of a fermented milk, enriched with <i>Kluyveromyces marxianus</i> B0399: a study on its impact on the intestinal microbiota of subjects with dysfunctional symptomatology.	Prof.Patrizia Brigidi* Simone Maccaferri*	*Department of pharmaceutical science Alma mater studiorum • Bologna University (Italy)	Bologna – Italy	
168	Human	Halitosis treatment through the administration of antibiotic-resistant lactic yeasts <i>K. marxianus fragilis</i> B0399 and the evaluation of the VSC levels with a digital halimeter	Dr. Piero Nobili, Dr Alberto R. Zarvit	Reparto di Odontoiatria Biologica, Istituto Stomatologico Italiano	Milano – Italy	

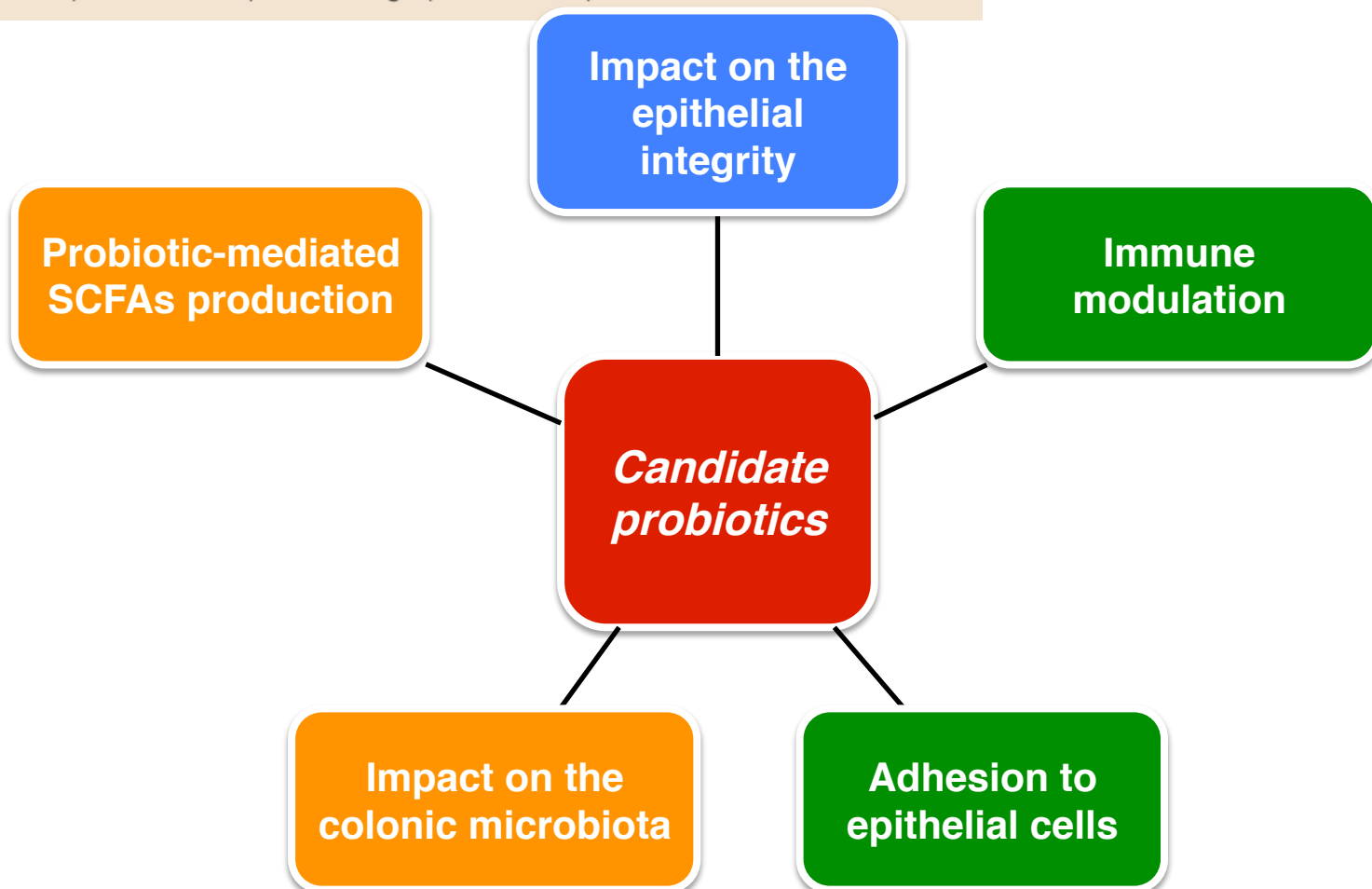
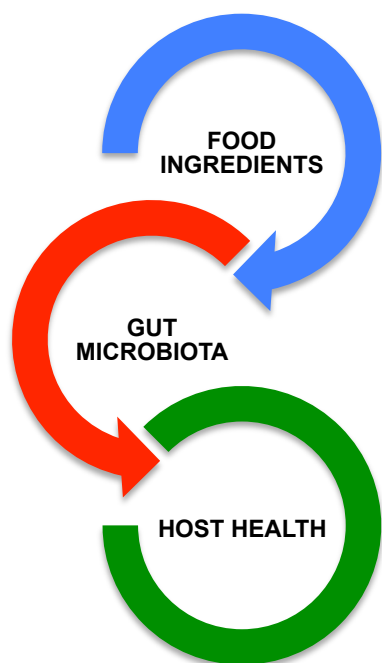


> Appl Environ Microbiol. 2012 Feb;78(4):956-64. doi: 10.1128/AEM.06385-11. Epub 2011 Dec 9.

Potential probiotic *Kluyveromyces marxianus* B0399 modulates the immune response in Caco-2 cells and peripheral blood mononuclear cells and impacts the human gut microbiota in an in vitro colonic model system

Simone Maccaferri¹, Annett Klinder, Patrizia Brigidi, Piero Cavina, Adele Costabile

American Society of
Microbiology Journal



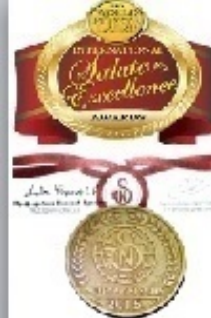
University of
Reading



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

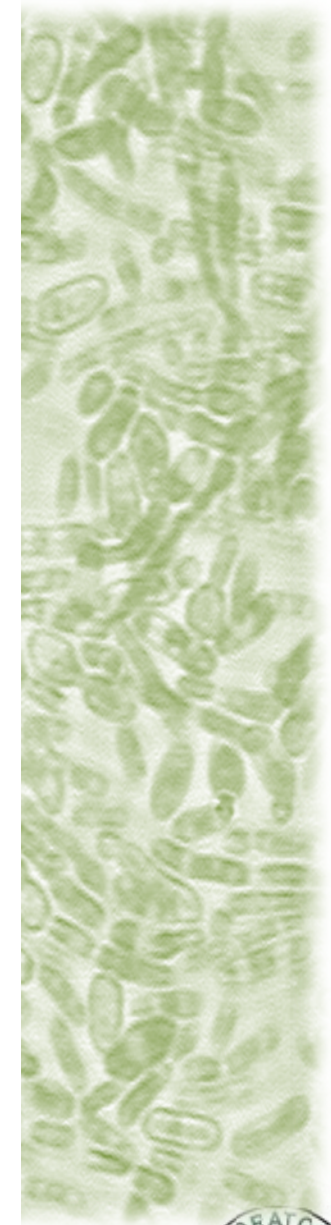
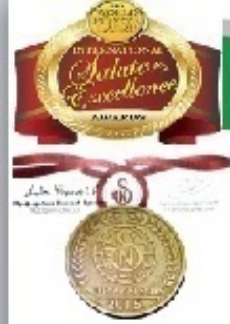
S.Maccaferri et al., 2012

University of Reading-UK, University of Bologna -IT

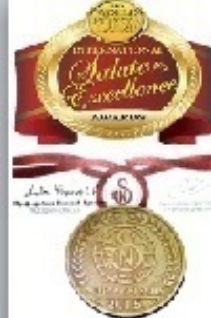


AEM study (University of Bologna and University of Reading, UK):
"With the effective dosage of only 10 million CFU/day,
***Kluyveromyces B0399* (K-B0399®)" :**

1. It colonizes the intestine: it is **categorized as strongly adhesive strain** (more than 40 yeast cells adhered to 1 model cell of intestinal)
2. It balances colonic microbiota by stimulating the **increase** of the concentration of **endogenous *Bifidobacteria* (bifidogenic effect)**.
3. **It effectively modulates immune response and induce immunological homeostasis** through fine balancing of cytokine (pro-and anti-inflammatory) production and fine tuning between defence mechanism and anti-inflammatory response (particularly in situations of excessive inflammation).
4. It provides **energy** and promotes the **growth of epithelial cells** of the colon by the **production of short-chain fatty acetate and propionate**.
5. It **reduces** the **toxicity** of faecal fluid.



"*Kluyveromyces B0399* (TURVAL B0399®)
demonstrated a number of beneficial, strain
specific properties desirable for application as a
new generation probiotic"



CLAIMS supported by scientific evidence (part 1):

1. Helps **maintain the balance of gut flora** (approved by Ministry of Health, 2005) (Studies 125, 132, 138,143)
2. It is **NATURAL, GUT FRIENDLY** species, part of healthy GUT MYCOBIOME (Gouba et al.,2015)
3. In **SIMBIOTIC** R-tion with gut microbiome: fortifies existing good bacteria (*bifidogenic effect*) with only 10 million CFU/day (Studies 125, 132, 138, 143);
4. Efficiently pass the **gastric berries** (Trial 35, 130.4B, 79B, 130.1B, 143)
5. Efficiently **colonizes intestine** (Trial 143)

CLAIMS supported by scientific evidence (part 2):



Fortifies immune system finely balancing between defence mechanism and immunological tolerance (eg. atopic dermatitis) (Trial 143, 96A-B)



Efficiently counteracts Irritable Bowel Syndrome (IBS) (Trial 16, 125, 130, 132, 138)



Reduce lactose content (high lactase activity) (Trial 35)



Has strong antimicrobial action (ex. *Candida albicans*) and efficiently compete against pathogens (Trial 57, 96A, 129, 143)



Not compromised by antibiotic use and prevents the side effects of antibiotic therapy (Trial 84.01, 84.02)



Reduces and prevents halitosis (Trial 168)



1. *Kluyveromyces B0399*[®] (TURVAL B0399[®]) improves naturally the **balance of gut flora**
2. It is **gut friendly** because fortifies existing good bacteria

- **Friendly:** It efficiently fortifies our already existing “good bacteria” (e.g. endogenous *Bifidobacteria*), considered human body’s first line of defense, allowing it to do a better job.

Minimum daily dosage: only 10 million CFU/die

Approved by the Italian Ministry of Health in 2009 conform at guideline about pre/probiotic (Dec. 2005)



- Taken daily , **it promotes the growth of our system’s own unique good bacterial flora**, by lowering our intestinal pH and creating a healthy intestinal environment.



Functional Foods



KLUYBREAD®



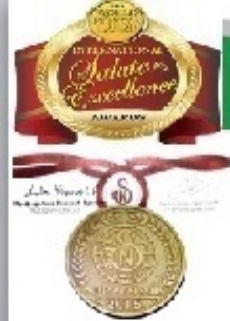
Human health



Animal health



Horse, pet and exotic



ZOOTECHNICAL NUTRITION MARKET

In the field of animals raised for food production, such as **cattle, swine** and **piglets**.



Specific formulations for: **Horses, Pets, Poultry, Ostriches, Pigeons, Camelids** and **others**.

HUMAN HEALTH MARKET

NUMEROUS PROBIOTIC BRANDS BASED ON TURVAL B0399®
DIFFERENT FORMULAS SUCCESSFULLY COLONISE WORLD MARKET

ITALIA



CAPSULES & DROPS
PAEDIATRICS & ADULTS

POWDER BAGS:
K.MARXIANUS, VITAMINS,
MINERALS, ENERGIZERS
ADULTS ONLY



CAPSULES PAEDIATRICS &
ADULTS



CAPSULES
PAEDIATRICS & ADULTS

Integratore Alimentare
a base di Lievito
Lattico Probiotico®

USA



INDIVIDUALLY WRAPPED SOFT
CHEWS/CARAMELS
PAEDIATRICS & ADULTS

CANADA



DUAL
GIT KIT:
CAPSULES - LIOPHILIZED PAPAYA
CAPSULES - K.MARXIANUS B0399
PAEDIATRICS & ADULTS



CANDIDIASIS KIT:
CAPSULES - INTESTINAL FLORA BALANCE
OVULES - VAGINAL FLORA BALANCE
ADULTS



CAPSULES
PAEDIATRICS & ADULTS



CAPSULES
PAEDIATRICS & ADULTS

FUNCTIONAL FOOD MARKET



KB0399® makes the **dough easily workable** and confers **pleasant flavour** to the final product (paraprobiotic and prebiotic effect).



PASTAE MATER (also for gluten free)
- sourdough in powder form containing B0399





COMING SOON ...

Kluyveromyces B0399® in **CHOCOLATE**



Chocolate cream



Dragée of
chocolate cereals



Kluyveromyces B0399® in the **FILLING**

Kluyveromyces B0399® on the
surface of **FROZEN BREAD**



Kluyveromyces B0399®
in **THE CAP**

Functional beverage
(power drinks, fruit
juice)



Sugar with *Kluyveromyces* B0399®

and on **FROZEN PIZZA**



EXAMPLES OF OTHER APPLICATIONS...



Mozzarella cheese



Stracchino cheese



Biscuits



Olive oil



Cereal bars



Beverage



Cereals for breakfast



Ice cream



and more...



IN HUMAN HEALTH & NUTRITION

FOOD SUPPLEMENTS (PHARMACEUTICALS)		CAPSULES	BioVAL, BioVAL-Complex, Ovocan, Eufgr, BioSympa, BioVi, Yiazorb, Lievilactis, Lactifast.	blister or jar
		POWDER BAGS	BioVAL, BioVAL complex, Sinerga.	
		LIQUID DROPS	BioVAL, Lievilactis	
FUNCTIONAL FOOD & BEVERAGES	CONFECTIONERY: INDUSTRY	CHOCOLATE	Probiocic	milk and dark chocolate bars
		SOFT CHEWS	BioVi	
		CHEWING GUM	(in progress)	
	DAIRY INDUSTRY	FERMENTED MILK PRODUCTS	Eufgr, Jogofir	
		KEFIR-TYPE	(in progress)	
		CREAM CHEESE	(in progress)	
	BEVERAGES WITH 2.0 CAP TECHNOLOGY	POWER DRINKS	(in progress)	probiotic + other active principles in cap + mineral water in bottle
		FRESH FLAVORED MILK	(in progress)	probiotic + flavors in cap + pasteurized milk in bottle
MEDICAL DEVICES		OVULES	Ovocan	

IN ZOOTECHNICAL NUTRITION

FEED COMPLEMENT		POWDER (JARS)	Turval 6 Horse Daily, Turval 12 Horse Sport, Turval 3 Camels, Turval 5 Camelids	lactic yeast + other ingredients (specific formulation for the target animal)
		POWDER (SACKS)	Turval 0sp/5	Lactic yeast used for pre- ferment the milk that is added to the food given to buffaloes
FEED MATERIAL		POWDER (SACKS)	Turval 0sp/5, Turval 0sp/50, Turval 0sp/500	lactic yeast at different degrees of probiotic activity (enter in different % in the final formulation produced by the distributor for the livestock: pig/piglet-cow/dairy cow-horse-sheep-goat-broiler-hen)

BAKERY INDUSTRY

FOOD NATURAL		BREAD, SAVORY SNACKS, PIZZA, BREADSTICKS	KluyBread (in progress)	Bread and breadsticks, snacks (sweet and savory) and pizza with lactic yeast, ancient taste of homemade bread
FUNCTIONAL FOOD		HEALTHY SAVORY SNACKS	KluyBread (in progress)	snacks (sweet and savory) with probiotic lactic yeast
FOOD QUALITY		ANTI MOLD effect for BREAD, SAVORY SNACKS, PIZZA,	in progress	Bread and breadsticks, snacks (sweet and savory) and pizza with Probiotic Lactic Yeast

***Kluyveromyces B0399[®]* (TURVAL B0399[®]) is a probiotic of new generation**

It helps to assure a considerable improvement in
the health and well-being in humans





Just out of curiosity. . .



BEFORE



**AFTER two
months of
treatment with
TURVAL 3 camel
daily**

(Gil Riegler Oasis Camel
Dairy- Ramona, California
USA.)

***In collaboration with the Nairobi University (Kenya) and the Ohio State
University***

**10 million THANK YOU/day
For your trust!**



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University of Udine

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