Registration Decision RD2010-10

# *Lactobacillus casei* strain LPT-111, *Lactobacillus rhamnosus* strain LPT-21, *Lactococcus lactis* ssp. *lactis* strain LL64/CSL, *Lactococcus lactis* ssp. *lactis* strain LL102/CSL, *Lactococcus lactis* ssp. *cremoris* strain M11/CSL

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# Registration Decision for for *Lactobacillus casei* strain LPT-111, *Lactobacillus rhamnosus* strain LPT-21, *Lactococcus lactis* ssp. *lactis* strain LL64/CSL, *Lactococcus lactis* ssp. *lactis* strains LL102/CSL and *Lactococcus lactis* ssp. *cremoris* strain M11/CSL

Health Canada's Pest Management Regulatory Agency (PMRA), under the authority of the *Pest Control Products Act*, and Regulations, is granting full registration for the sale and use of *Lactobacillus casei* Technical, *Lactobacillus rhamnosus* Technical, *Lactococcus lactis* ssp. *lactis* Technical and *Lactococcus lactis* ssp. *cremoris* Technical, DOM Manufacturing Concentrate and the end-use product Organo-Sol, containing the microbial pest control agents *Lactobacillus casei* strain LPT-111, *Lactobacillus rhamnosus* strain LPT-21, *Lactococcus lactis* ssp. *lactis* strain LL64/CSL, *Lactococcus lactis* ssp. *lactis* strain LL102/CSL and *Lactococcus lactis* ssp. *cremoris* strain M11/CSL, for the partial suppression of clovers, black medick, bird's-foot trefoil, and wood sorrel in established lawns.

An evaluation of available scientific information found that, under the approved conditions of use, the product has value and does not present an unacceptable risk to human health or the environment.

These products were first proposed for registration in the consultation document[1] Proposed Registration Decision PRD2010-09, *Lactobacillus casei* strain LPT-111, *Lactobacillus rhamnosus* strain LPT-21, *Lactococcus lactis* ssp. *lactis* strain LL64/CSL, *Lactococcus lactis* ssp. *lactis* strain LL102/CSL *Lactococcus lactis* ssp. *cremoris* strain M11/CSL. This Registration Decision[2] describes this stage of the PMRA's regulatory process for *Lactobacillus casei* Technical, *Lactobacillus rhamnosus* Technical, *Lactococcus lactis* ssp. *lactis* Technical and *Lactococcus lactis* ssp. *cremoris* Technical, DOM Manufacturing Concentrate and Organo-Sol and summarizes the Agency's decision and the reasons for it. The PMRA received no comments on PRD2010-09. This decision is consistent with the proposed registration decision stated in PRD2010-09.

For more details on the information presented in this Registration Decision, please refer to the Proposed Registration Decision PRD2010-09 that contains a detailed evaluation of the information submitted in support of this registration.

[1] "Consultation statement" as required by subsection 28(2) of the *Pest Control Products Act.*

[2] "Decision statement" as required by subsection 28(5) of the *Pest Control Products Act.*

## What Does Health Canada Consider When Making a Registration Decision?

The key objective of the *Pest Control Products Act* is to prevent unacceptable risks to people and the environment from the use of pest control products. Health or environmental risk is considered acceptable[3] if there is reasonable certainty that no harm to human health, future generations or the environment will result from use or exposure to the product under its conditions of registration. The Act also requires that products have value[4] when used according to label directions. Conditions of registration may include special precautionary measures on the product label to further reduce risk.

To reach its decisions, the PMRA applies modern, rigorous risk-assessment methods and policies. These methods consider the unique characteristics of sensitive subpopulations in humans (e.g. children) as well as organisms in the environment (e.g. those most sensitive to environmental contaminants). These methods and policies also consider the nature of the effects observed and the uncertainties when predicting the impact of pesticides. For more information on how the PMRA regulates pesticides, the assessment process and risk-reduction programs, please visit the Pesticides and Pest Management portion of Health Canada's website at healthcanada.gc.ca/pmra.

## What is Lactobacillus *casei* strain LPT-111, *Lactobacillus rhamnosus* strain LPT-21, *Lactococcus lactis* ssp. *lactis* strains LL64/CSL and LL102/CSL and *Lactococcus lactis* ssp. *cremoris* strain M11/CSL?

*Lactobacillus casei* strain LPT-111, *Lactobacillus rhamnosus* strain LPT-21, *Lactococcus lactis* ssp. *lactis* strains LL64/CSL and LL102/CSL, and *Lactococcus lactis* ssp. *cremoris* strain M11/CSL are lactic acid bacteria that produce the fermentation products citric acid and lactic acid. Due to the presence of citric acid and lactic acid in the end-use product Organo-Sol, it has a low pH (~3.5) that allows for penetration of plant cells causing tissue necrosis and suppression of plant growth. Plant species most susceptible to Organo-Sol are those with a thin leaf cuticle. Organo-Sol is a commercial herbicide used for the partial suppression of clovers, black medick, bird's-foot trefoil, and wood sorrel in established lawns.

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3 "Acceptable risks" as defined by subsection 2(2) of the *Pest Control Products Act.*

4 "Value" as defined by subsection 2(1) of *Pest Control Products Act*"...the product's actual or potential contribution to pest management, taking into account its conditions or proposed conditions of registration, and includes the product's (*a*) efficacy; (*b*) effect on host organisms in connection with which it is intended to be used; and (*c*) health, safety and environmental benefits and social and economic impact".

## Health Considerations

Can Approved Uses of *Lactococcus lactis* ssp. *lactis* strains LL64/CSL and LL102/CSL, *Lactococcus lactis* ssp. *cremoris* strain M11/CSL, *Lactobacillus rhamnosus* strain LPT-21, and *Lactobacillus casei* strain LPT-111 and Their Fermentation Products, Citric Acid and Lactic Acid, Affect Human Health?

***Lactococcus lactis* ssp. *lactis* strains LL64/CSL and LL102/CSL, *Lactococcus lactis* ssp. *cremoris* strain M11/CSL, *Lactobacillus rhamnosus* strain LPT-21, and *Lactobacillus casei* strain LPT-111 and their fermentation products, citric acid and lactic acid, are unlikely to affect your health when Organo-Sol is used according to the label directions.**

Exposure to *Lactococcus lactis* ssp. *lactis* strains LL64/CSL and LL102/CSL, *Lactococcus lactis* ssp. *cremoris* strain M11/CSL, *Lactobacillus rhamnosus* strain LPT-21, and *Lactobacillus casei* strain LPT-111 and their fermentation products, citric acid and lactic acid, may occur during handling of Organo-Sol.

When assessing the health risks associated with microbial active ingredients, several key factors are considered: a microorganism's biological properties (e.g. production of toxic byproducts), reports of any adverse incidents, potential to cause disease or toxicity as determined in toxicological studies and the level to which people may be exposed relative to exposures already encountered in nature to other isolates of this microorganism.

For biochemical actives, the levels where no health effects occur and the levels to which people may be exposed are considered. The dose levels used to assess risks are established to protect the most sensitive human population (e.g. children and nursing mothers). Only uses for which the exposure is well below levels that cause no effects in animal testing are considered acceptable for registration.

The lactic acid bacteria used in the manufacture of Organo-Sol and their organic acids are already occurring in the food chain for human consumption at similar levels to those found in Organo-Sol and there have been relatively few reports of infection or adverse effects despite their ubiquity.

The fermentation products, citric acid and lactic acid, are of low acute toxicity by the oral route. Lactic acid is of low acute toxicity via the dermal route while both lactic and citric acid are slightly irritating to the skin. Eye irritation studies indicated that, at the concentrations found in Organo-Sol, lactic acid and citric acid are capable of producing moderate to severe injury to the eye, particularly with repeated or prolonged exposure. Appropriate label statements and requirements for basic personal protective equipment will minimize exposure.

## Residues in Water and Food

**Dietary risks from food and water are not of concern.**

As part of the assessment process prior to the registration of a pesticide, the PMRA must determine whether the consumption of the maximum amount of residues, that are expected to remain on food products when a pesticide is used according to label directions, will not be a concern to human health. This maximum amount of residues expected is then legally established as a maximum residue limit under the *Pest Control Products Act* for the purposes of the adulteration provision of the *Food and Drugs Act*. The PMRA sets science-based maximum residue limits to ensure the food Canadians eat is safe.

As there are no direct applications to food and no significant adverse effects were reported in Tier I acute toxicity/pathogenicity studies, the establishment of maximum residue limits are not required for *Lactococcus lactis* ssp. *lactis* strains LL64/CSL and LL102/CSL, *Lactococcus lactis* ssp. *cremoris* strain M11/CSL, *Lactobacillus rhamnosus* strain LPT-21, *Lactobacillus casei* strain LPT-111 and their fermentation products, citric acid and lactic acid. In addition, the likelihood of residues of *Lactococcus lactis* ssp. *lactis* strains LL64/CSL and LL102/CSL, *Lactococcus lactis* ssp. *cremoris* strain M11/CSL, *Lactobacillus rhamnosus* strain LPT-21, *Lactobacillus casei* strain LPT-111, citric acid or lactic acid contaminating drinking water supplies is negligible. Consequently, dietary exposure and risk are minimal to non-existent.

## Occupational Risks From Handling Organo-Sol

**Occupational risks are not of concern when Organo-Sol is used according to label directions, which include protective measures.**

Users of Organo-Sol can come into direct contact with *Lactococcus lactis* ssp. *lactis* strains LL64/CSL and LL102/CSL, *Lactococcus lactis* ssp. *cremoris* strain M11/CSL, *Lactobacillus rhamnosus* strain LPT-21, *Lactobacillus casei* strain LPT-111, citric acid or lactic acid primarily via the skin or eyes. As a standard requirement intended to minimize exposure, the label specifies that users of Organo-Sol must wear water-proof gloves, long-sleeved shirts, long pants, shoes and socks and eye-goggles. Users are also directed to avoid inhaling the product and its mists.

As the end-use product may contain the allergen, unmodified milk protein (whey), the Organo-Sol label restricts entry and re-entry into treated areas until the spray is dried.

## Environmental Considerations

### What Happens When Organo-Sol Is Introduced Into the Environment?

**Environmental risks are not of concern.**

Lactic acid bacteria are considered widespread in nature and can be recovered from water, soil, manure, sewage, and silage as well as from a variety of plant material such as fruit, vegetables, grass, and clover. Lactic acid bacteria are also part of the commensal microflora of humans and animals as part of the gastrointestinal tract, oral cavity, and vagina. Published literature indicates that although lactic acid bacteria can survive outside of the dairy environment they are unlikely to thrive. As well, the number of lactic acid bacteria contained in Organo-Sol is relatively low. Since the use of Organo-Sol is not likely to result in an increase of the number of lactic acid bacteria in the environment, the risk to terrestrial and aquatic non-target organisms from lactic acid bacteria is negligible.

Citric acid and lactic acid readily undergo biotransformation in terrestrial and aquatic environments. Given the ubiquitous nature of citric acid and lactic acid in animals, plants, edible food commodities and industrial chemicals, the proposed uses of Organo-Sol on lawns is not expected to result in a considerable increase in exposure to non-target terrestrial and aquatic organisms. Furthermore, reports in published literature of cases of adverse effects, as well as published toxicological endpoints, do not suggest that exposure of non-target terrestrial and aquatic organisms to the levels of citric acid and lactic acid in Organo-Sol will pose a concern with respect to toxicity. Based on the available data, citric acid and lactic acid are expected to pose negligible risk to terrestrial and aquatic organisms under the conditions of use.

## Value Considerations

### What Is the Value of Organo-Sol?

**Acids in Organo-Sol produced by living lactic acid bacteria cause cell necrosis and suppression of plant growth after penetrating into plant cells.**

Application of Organo-Sol provides partial suppression of white clover, red clover, bird’s-foot trefoil, black medick, and wood sorrel in established lawns. Based on the mode of action of Organo-Sol, development of herbicide resistance is unlikely. The availability of Organo-Sol contributes to an integrated and sustainable pest management program in turf.

## Measures to Minimize Risk

Registered pesticide product labels include specific instructions for use. Directions include risk-reduction measures to protect human and environmental health. These directions are required by law to be followed.

The key risk-reduction measures on the label of Organo-Sol to address the potential risks identified in this assessment are as follows:

**Key Risk-Reduction Measures**

**Human Health**

To minimize exposure to *Lactococcus lactis* ssp. *lactis* strains LL64/CSL and LL102/CSL, *Lactococcus lactis* ssp. *cremoris* strain M11/CSL, *Lactobacillus rhamnosus* strain LPT-21, and *Lactobacillus casei* strain LPT-111 and their fermentation products, citric acid and lactic acid, all applicators, mixer-loaders and handlers must wear water-proof gloves, long-sleeved shirts, long pants, shoes and socks and eye goggles. A label statement directing users to avoid inhaling the product and its mists is also included.

As the end-use product may contain the allergen, unmodified milk protein (whey), the Organo-Sol label restricts entry and re-entry into treated areas until the spray is dried.

**Environment**

As a general precaution, statements will be added to the label to prevent handlers from contaminating aquatic habitats and systems, and to prevent the accidental treatment of desirable plants with Organo-Sol.

## Other Information

The relevant test data on which the decision is based (as referenced in this document) are available for public inspection, upon application, in the PMRA's Reading Room (located in Ottawa). For more information, please contact the PMRA's Pest Management Information Service by phone (1-800-267-6315) or by e-mail (pmra.inforserv@hc-sc.gc.ca).

Any person may file a notice of objection[5] regarding this registration decision within 60 days from the date of publication of this Registration Decision. For more information regarding the basis for objecting (which must be based on scientific grounds), please refer to the Pesticides and Pest Management portion of Health Canada's website (Request a Reconsideration of Decision, healthcanada.gc.ca/pmra) or contact the PMRA's Pest Management Information Service by phone (1-800-267-6315) or by e-mail (pmra.inforserv@hc-sc.gc.ca).

[5] As per subsection 35(1) of the *Pest Control Products Act.*

# References

## A. List of Studies/Information Submitted by Registrant

PMRA Document Number: 1626955
Reference: 2007, Codex alimentarius commission, Codex stan 192-1995, FAO & WHO. FAO Headquarters, Rome, Italy, Data Numbering Code: M1.3,M2.9.3,M4.0,M9.0

PMRA Document Number: 1626956
Reference: 2008, Confirmation of organic acid composition of Organo-sol and the absence of formic acid in Organo-Sol, Data Numbering Code: M10.0

PMRA Document Number: 1626957
Reference: 2005, Dose-response experiment in greenhouse, Data Numbering Code: M10.0

PMRA Document Number: 1626958
Reference: 2006, Weed suppressive activity of Organo-sol, dairy by-product, Data Numbering Code: M10.0,M2.7.2

PMRA Document Number: 1626959
Reference: 2005, Weed suppressive activity of Organo-sol, dairy by-product, Data Numbering Code: M10.0,M9.8.1

PMRA Document Number: 1626960
Reference: 2006, Weed suppressive activity of Organo-sol, dairy by-product, Data Numbering Code: M10.0,M9.8.1

PMRA Document Number: 1626962
Reference: 2007, Product characterization and analysis, Data Numbering Code: M2.0
Confidential Business Information

PMRA Document Number: 1626968
Reference: Institut Rosell, Lactobacillus casei Rosell-215, Data Numbering Code: M2.7.2

PMRA Document Number: 1626969
Reference: Institut Rosell, Lactobacillus rhamnosusi Rosell-011, Data Numbering Code: M2.7.2

PMRA Document Number: 1626975
Reference: 2002, DOM, a mix containing Lactococcus lactis subsp. lactis and Lactococcus lactis subsp. cremoris, Data Numbering Code: M2.7.2,M2.8

PMRA Document Number: 1626976
Reference: 2007, Guides des bonnes pratiques industrielles (BPI), Data Numbering Code: M2.8

PMRA Document Number: 1626977
Reference: 2007, Certificate of registration, Data Numbering Code: M2.8

PMRA Document Number: 1626978
Reference: 2002, Certificate of analysis, Data Numbering Code: M2.8

PMRA Document Number: 1626979
Reference: 2008, Organo-Sol Manufacturing and Quality Assurance Processes, Data Numbering Code: M2.8 Confidential Business Information

PMRA Document Number: 1626981
Reference: 2007, Whey analysis, Data Numbering Code: M2.8

PMRA Document Number: 1626982
Reference: 2008, Organo-Sol Analysis (5 batches), Data Numbering Code: M2.10.1,M2.10.2,M2.8 Confidential Business Information

PMRA Document Number: 1626983
Reference: 2007, Certificat d analyse, Data Numbering Code: M2.10.2,M2.8 Confidential Business Information

PMRA Document Number: 1626984
Reference: 2005, Sucres et acides organiques avec HPLC Dionex, Data Numbering Code: M2.10.1,M2.12,M2.8,M2.9.2,M2.9.3

PMRA Document Number: 1626988
Reference: 2007, Summary, human health and safety testing, Data Numbering Code: M4.1

PMRA Document Number: 1626989
Reference: 1992, Citric acid, Data Numbering Code: M4.1,M9.1

PMRA Document Number: 1626991
Reference: 2005, Acute Oral Infectivity and Toxicity - Waiver Request, Data Numbering Code: M4.2.2

PMRA Document Number: 1626995
Reference: Institut Rosell, 2002, Probiotics effects of Lactobacillus rhamnosus Rosell-11, Data Numbering Code: M2.7.1,M2.7.2,M2.8,M4.2.2

PMRA Document Number: 1627031
Reference: 2005, Acute Dermal Toxicity: Waiver Request, Data Numbering Code: M4.4

PMRA Document Number: 1627039
Reference: 2005, Eye Irritation: Waiver Request, Data Numbering Code: M4.9

PMRA Document Number: 1627041
Reference: 2007, Exposure assessment, Data Numbering Code: M5.0

PMRA Document Number: 1627042
Reference: 2007, Summary: Environmental toxicology, Data Numbering Code: M9.1

PMRA Document Number: 1627043
Reference: 2005, Waiver requested for avian oral toxicity study, Data Numbering Code: M9.2

PMRA Document Number: 1627086
Reference: 2005, Waiver requested for freshwater fish toxicity/infectivity study, Data Numbering Code: M9.4.1

PMRA Document Number: 1627092
Reference: 2005, Waiver requested for terrestrial arthropods study, Data Numbering Code: M9.5.1

PMRA Document Number: 1627095
Reference: 2005, Waiver requested for aquatic arthropods study, Data Numbering Code: M9.5.2

PMRA Document Number: 1627098
Reference: 2005, Waiver requested for non-arthropod invertebrates study, Data Numbering Code: M9.6

PMRA Document Number: 1627101
Reference: 2005, Waiver requested for terrestrial and aquatic plants, Data Numbering Code: M9.8.1,M9.8.2

PMRA Document Number: 1806709
Reference: 2009, Certificate for quality control, Data Numbering Code: M2.8

PMRA Document Number: 1806710
Reference: 2009, Technical data sheet on strains of final product, Data Numbering Code: M2.8

PMRA Document Number: 1806731
Reference: 1977, International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure, Data Numbering Code: M2.7.1

PMRA Document Number: 1806732
Reference: 2008, Specifications, Data Numbering Code: M2.8

PMRA Document Number: 1814374
Reference: 2009, Response to clarification request, Data Numbering Code: M2.7

PMRA Document Number: 1814376
Reference: 2009, Response to clarification request, Data Numbering Code: M2.7

PMRA Document Number: 1814379
Reference: 2009, Response to clarification request, Data Numbering Code: M2.7

PMRA Document Number: 1626961
Reference: 2008, Value summary (including efficacy), Data Numbering Code: M10

PMRA Document Number: 1626960
Reference: 2008, Weed suppressive activity of Organo-sol, dairy by-product. Annual Report (May 2006), Data Numbering Code: M10 and M9.8.1

PMRA Document Number: 1626959
Reference: 2008, Weed suppressive activity of Organo-sol, dairy by-product. Annual Report (June 2005), Data Numbering Code: M10 and M9.8.1

PMRA Document Number: 1626958
Reference: 2008, Weed suppressive activity of Organo-sol, dairy by-product. Final Report (December 2006), Data Numbering Code: M10 and M2.7.2

PMRA Document Number: 1626957
Reference: 2008, Study project report (PR-OS-003) – Dose response experiment in greenhouse, Data Numbering Code: M10.0

## 2.0 Applicant Submitted Data - Published Information

PMRA Document Number: 1626963
Reference: Facklam, R. and J. A. Elliott, 1995, Identification, Classification, and Clinical Relevance of Catalase-Negative, Gram-Positive Cocci, excluding the Streptococci and Enterococci, Clinical Microbiology Reviews 8(4): 479-495, Data Numbering Code: M2.10.1,M2.7.1

PMRA Document Number: 1626964
Reference: Rossetti, L. and G. Giraffa, 2005, Rapid identification of dairy lactic acid bacteria by M13-generated, RAPD-PCR fingerprint databases, Journal of Microbiological Methods 63(2): 135-44, Data Numbering Code: M2.10.1,M2.7.1

PMRA Document Number: 1626965
Reference: Gasser, F., 2008, Safety of lactic acid bacteria and their occurence in human clinical infections, Bulletin of the Institute Pasteur 92: 45-67, Data Numbering Code: M2.7.2

PMRA Document Number: 1626966
Reference: Hummel, A. S., C. Hertel, et al., 2006, Antibiotic Resistances of Starter and Probiotic Strains of Lactic Acid Bacteria., Applied and environmental microbiology 73(3): 730-739, Data Numbering Code: M2.7.2

PMRA Document Number: 1626967
Reference: Husni, R.N. et al., 2008, Lactobacillus bacteremia and endocarditis: review of 45 cases, Clinical Infectious Diseases 25:1048-55, Data Numbering Code: M2.7.2

PMRA Document Number: 1626970
Reference: Kritas, S. K. and R. B. Morrison, 2006, Effect of orally administered Lactobacillus casei on porcine reproductive and respiratory syndrome (PRRS) virus vaccination in pigs., Veterinary Microbiology 119(2-4): 248-55, Data Numbering Code: M2.7.2

PMRA Document Number: 1626971
Reference: Marshall, V.M., 1993, Starter cultures for milk fermentation and their characteristics, Journal of the Society of Dairy Technology, 46(2), Data Numbering Code: M2.7.2

PMRA Document Number: 1626972
Reference: Reid, A. A., C. P. Champagne, et al., 2007, Survival in food systems of Lactobacillus rhamnosus R011 microentrapped in whey protein gel particles, Journal of Food Science 72(1): M31-M37, Data Numbering Code: M2.7.2

PMRA Document Number: 1626973
Reference: Salminen, S. and Arvilommi, H., 2008, Safety of Lactobacillus strains used as probiotic agents - reply, Clinical Infectious Diseases Correspondance. 34: 1284-1285, Data Numbering Code: M2.7.2

PMRA Document Number: 1626974
Reference: Scolari, G., S. Torriani, et al., 1998, Partial characterization and plasmid linkage of a non-proteinaceous antimicrobial compound in a Lactobacillus casei strain of vegetable origin., Journal of Applied Microbiology 86(4): 682-8, Data Numbering Code: M2.7.2

PMRA Document Number: 1626985
Reference: Health canda, 2001, HPB Method MFHPB-33, Data Numbering Code: M2.9.2

PMRA Document Number: 1626986
Reference: Hazardous Substances Data Bank, Formic acid., Data Numbering Code: M2.9.3

PMRA Document Number: 1626987
Reference: Suarez-Luque, S., I. Mato, et al., 2006, Capillary zone electrophoresis method for the determination of inorganic anions and formic acid in honey., Journal of Agricultural Food Chemistry 54(25): 9292-6, Data Numbering Code: M2.9.3

PMRA Document Number: 1626990
Reference: Salminen, S., A. von Wright, et al., 1998, Demonstration of safety of probiotics: a review, International Journal of Food Microbiology 44(1-2): 93-106, Data Numbering Code: M2.7.2,M4.1,M9.1

PMRA Document Number: 1626992
Reference: Ishibashi, N. and S. Yamazaki, 2001, Probiotics and safety, American Journal of Clinical Nutrition 73(2 Suppl): 465S-470S, Data Numbering Code: M4.2.2

PMRA Document Number: 1626993
Reference: Merk, K., C. Borelli, et al., 2004, Lactobacilli - bacteria-host interactions with special regard to the urogenital tract, International Journal of Medical Microbiology 295(1) 9-18, Data Numbering Code: M4.2.2

PMRA Document Number: 1626994
Reference: Saxelin, M., H. Rautelin, et al., 2008, Safety of commercial products with viable Lactobacillus strains, Infectious Diseases in Clinical Practice 5(5): 331-335, Data Numbering Code: M4.2.2

PMRA Document Number: 1626996
Reference: Antolin, J., R. Ciguenza, et al., 2004, Liver abscess caused by Lactococcus lactis cremoris: a new pathogen., Scandanavian Journal of Infectious Diseases 36(6-7): 490-1, Data Numbering Code: M2.7.2,M4.2.2

PMRA Document Number: 1626997
Reference: Bruce, A. W. and G. Reid, 1998, Intravaginal instillation of lactobacilli for prevention of recurrent urinary tract infections., Canadian Journal of Microbiology 34(3): 339-43, Data Numbering Code: M2.7.2,M4.2.2

PMRA Document Number: 1626998
Reference: Cannon, J. P., T. A. Lee, et al., 2004, Pathogenic relevance of Lactobacillus: a retrospective review of over 200 cases., European Journal of Clinical Microbiological Infectious Diseases 24(1): 31-40, Data Numbering Code: M2.7.2,M4.2.2

PMRA Document Number: 1626999
Reference: Gill, H. S. and K. J. Rutherfurd, 2001, Viability and dose-response studies on the effects of the immunoenhancing lactic acid bacterium Lactobacillus rhamnosus in mice, British Journal of Nutrition 86(2): 285-9, Data Numbering Code: M2.7.2,M4.2.2

PMRA Document Number: 1627000
Reference: Gonzalez, S., G. Albarracin, et al., 1990, Prevention of infantile diarrhoea by fermented milk, Microbiologie, Aliments, Nutrition 8(4): 349-354, Data Numbering Code: M2.7.2,M4.2.2

PMRA Document Number: 1627001
Reference: Helin, T., S. Haahtela, et al., 2001, No effect of oral treatment with an intestinal bacterial strain, Lactobacillus rhamnosus (ATCC 53103), on birch-pollen allergy: a placebo-controlled double-blind study, Allergy 57(3): 243-6, Data Numbering Code: M2.7.2,M4.2.2

PMRA Document Number: 1627002
Reference: Pavan, S., P. Desreumaux, et al., 2003, Use of mouse models to evaluate the persistence, safety, and immune modulation capacities of lactic acid bacteria., Clinical Diagnostic Laboratory Immunology Vol 10(4): 696-701, Data Numbering Code: M2.7.2,M4.2.2

PMRA Document Number: 1627003
Reference: Srinivasan et al, 2006, Clinical Safety of Lactobacillus casei shirota as a Probiotic in Critically Ill Children, Journal of Pediatric Gastroenterology and Nutrition, 42:171-173, Data Numbering Code: M2.7.2,M4.2.2

PMRA Document Number: 1627004
Reference: Villena, J., S. Racedo, et al., 2005, Lactobacillus casei improves resistance to pneumococcal respiratory infection in malnourished mice., Journal of Nutrition 135(6): 1462-9, Data Numbering Code: M2.7.2,M4.2.2

PMRA Document Number: 1627005
Reference: Zhou, J. S., Q. Shu, et al., 1999, Acute oral toxicity and bacterial translocation studies on potentially probiotic strains of lactic acid bacteria., Food Chemistry and Toxicology 38(2-3): 153-6, Data Numbering Code: M2.7.2,M4.2.2

PMRA Document Number: 1627006
Reference: Kalliomaki, M., S. Salminen, et al., 2003, Probiotics and prevention of atopic disease: 4-year follow-up of a randomised placebo-controlled trial., Lancet 361(9372): 1869-71, Data Numbering Code: M2.7.2,M4.2.2,M4.4

PMRA Document Number: 1627007
Reference: Rosenfeldt, V., E. Benfeldt, et al., 2002, Effect of probiotic Lactobacillus strains in children with atopic dermatitis., Journal of Allergy and Clinical Immunology 111(2): 389-95, Data Numbering Code: M2.7.2,M4.2.2,M4.4

PMRA Document Number: 1627008
Reference: Chin-Wen, L., C. HsiaoLing, et al., 1999, Identification and characterisation of lactic acid bacteria and yeasts isolated from kefir grains in Taiwan, Australian Journal of Dairy Technology 54: 14-18, Data Numbering Code: M4.2.2,M4.4,M4.9

PMRA Document Number: 1627009
Reference: Dousset, X. and F. Caillet, 1993, Microbiological and biochemical aspects of kefir fermentation, Microbiologie, Aliments, Nutrition 11(4): 463-470, Data Numbering Code: M4.2.2,M4.4,M4.9

PMRA Document Number: 1627010
Reference: Eck, A., 1984, Le Fromage, 2nd ed. Diffusion Lavoisier, Paris, Chapter 4, p: 497-509, Data Numbering Code: M4.2.2,M4.4,M4.9

PMRA Document Number: 1627011
Reference: Farzanfar, A., 2006, The use of probiotics in shrimp aquaculture, FEMS Immunological Medicine Microbiology 48(2): 149-58, Data Numbering Code: M4.2.2,M4.4,M4.9

PMRA Document Number: 1627012
Reference: Garrote, G. L., A. G. Abraham, et al., 1999, Inhibitory power of kefir: the role of organic acids., Journal of Food Protection 63(3): 364-9, Data Numbering Code: M4.2.2,M4.4,M4.9

PMRA Document Number: 1627013
Reference: Kneifel, W., D. Jaros, et al., 1992, Microflora and acidification properties of yogurt and yogurt-related products fermented with commercially available starter cultures, International Journal of Food Microbiology 18(3): 179-89, Data Numbering Code: M4.2.2,M4.4,M4.9

PMRA Document Number: 1627014
Reference: Salminen, S. and A. C. Ouwehand, 2002, Probiotics, Applications in Dairy Products, Encyclopedia of dairy sciences: 2315-2322, Data Numbering Code: M4.2.2,M4.4,M4.9

PMRA Document Number: 1627015
Reference: Salminen, S., A von Wright, et al., 1998, Lactic acid bacteria in health and disease, In: Lactic acid bacteria: microbiology and functional aspects (Ed by S. Salminen and A. von Wright), p221-253. New York: Macel Dekke, Inc, Data Numbering Code: M4.2.2,M4.4,M4.9

PMRA Document Number: 1627016
Reference: UNEP, 2001, SIDS Initial Assessment Report: Citric Acid, UNEP publications (United Nations Environment Programme), Data Numbering Code: M4.2.2,M4.4,M4.9

PMRA Document Number: 1627017
Reference: Van de Water J., 2003, Yogurt and Immunity: The Health Benefits of Fermented Milk Products that Contain Lactic Acid Bacteria, Handbook of fermented functional foods, chapter 5. Edited by Edward R. Farnworth. CRC Press. p: 113-144, Data Numbering Code: M4.2.2,M4.4,M4.9

PMRA Document Number: 1627018
Reference: Hammes, W. P. and C. Hertel, 2006, The Genera Lactobacillus and Carnobacterium, Prokaryotes. 4: 320-403, Data Numbering Code: M1.2,M4.2.2,M4.4,M4.9

PMRA Document Number: 1627019
Reference: Teuber, M. and A. Geis, 2006, The Genus lactococcus, Prokaryotes. 4: 205-228, Data Numbering Code: M1.2,M2.7.2,M4.2.2,M4.4,M4.9,M9.1

PMRA Document Number: 1627020
Reference: Agarwal, K. N., S. K. Bhasin, et al., 2001, Lactobacillus casei in the control of acute diarrhea--a pilot study., Indian Pediatrics 38(8): 905-10, Data Numbering Code: M2.7.2,M4.2.2,M4.4,M4.9

PMRA Document Number: 1627021
Reference: Garver, K. I. and P. M. Muriana, 1993, Detection, identification and characterization of bacteriocin-producing lactic acid bacteria from retail food products, International Journal of Food Microbiology 19(4): 241-58, Data Numbering Code: M2.7.2,M4.2.2,M4.4,M4.9

PMRA Document Number: 1627022
Reference: Thapa, N., J. Pal, et al., 2005, Phenotypic identification and technological properties of lactic acid bacteria isolated from traditionally processed fish products of the Eastern Himalayas., International Journal of Food Microbiology 107(1): 33-8, Data Numbering Code: M

PMRA Document Number: 1627023
Reference: Uhlman, L., U. Schillinger, et al., 1992, Identification and characterization of two bacteriocin-producing strains of Lactococcus lactis isolated from vegetables., International Journal of Food Microbiology 16(2): 141-51, Data Numbering Code: M2.7.2,M4.2.2,M4.4,M4.9

PMRA Document Number: 1627024
Reference: Akalin, A. S., S. Gonc, et al., 2002, Variation in organic acids content during ripening of pickled white cheese., Journal of Dairy Science 85(7): 1670-6, Data Numbering Code: M2.9.3,M4.2.2,M4.4,M4.9

PMRA Document Number: 1627025
Reference: Fernandez-Garcia, E. and J. U. McGregor, 1994, Determination of organic acids during the fermentation and cold storage of yogurt., Journal of Dairy Science 77(10): 2934-9, Data Numbering Code: M2.9.3,M4.2.2,M4.4,M4.9

PMRA Document Number: 1627026
Reference: Fuller, R., 1989, Probiotics in man and animals, Journal of Applied Bacteriology 66(5): 365-78, Data Numbering Code: M2.7.2,M4.1,M4.2.2,M4.4,M4.9,M9.1

PMRA Document Number: 1627027
Reference: Cossins E.A., 1964, Formation and metabolism of lactic acid during germination of pea seadlings, Letters to Nature 203: 989-990, Data Numbering Code: M4.2.2,M4.4,M4.9,M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627028
Reference: Merck and Co., Inc., 2006, The Merck Index, 14th ed. Whitehouse Station, NJ: Merck and Co., Inc, Data Numbering Code: M4.2.2,M4.4,M4.9,M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627029
Reference: Saradhuldhat P. and R.E Paull., 2007, Pineapple organic acid metabolism and accumulation during fruit development, Scientia Horticulturae 112: 297-303, Data Numbering Code: M4.2.2,M4.4,M4.9,M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627030
Reference: Wiley & Sons, 2008, Kirk-Othmer Encyclopedia of Chemical Technology, 5th edition. NY. Willey & Sons, Inc., Data Numbering Code: M4.2.2,M4.4,M4.9,M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627032
Reference: Ditre, C. M., T. D. Griffin, et al., 1996, Effects of alpha-hydroxy acids on photoaged skin: a pilot clinical, histologic, and ultrastructural study, Journal of American Academic Dermatology 34(2 Pt 1): 187-95, Data Numbering Code: M4.4

PMRA Document Number: 1627033
Reference: Schliemann-Willers, S., S. Fuchs, et al., 2004, Fruit acids do not enhance sodium lauryl sulphate-induced cumulative irritant contact dermatitis in vivo, Acta Dermatological Venereology 85(3): 206-10, Data Numbering Code: M4.4

PMRA Document Number: 1627034
Reference: Smith, W. P., 1996, Epidermal and dermal effects of topical lactic acid, Journal of American Academic Dermatology 35(3 Pt 1): 388-91, Data Numbering Code: M4.4

PMRA Document Number: 1627035
Reference: Baumann L. and E. Weisberg, 2002, Cosmetic Dermatology: Principles and Practice, New York. Mc-Graw-Hill Companies Inc. 226 pages. Chapter: Other ingredients p:93-99, Data Numbering Code: M4.4,M4.9

PMRA Document Number: 1627036
Reference: U.S. Patent Office, 1995, US Patent 5447920: Cosmetic composition containing inclusion product with hydroxyalkylated cyclodextrin, Data Numbering Code: M4.4,M4.9

PMRA Document Number: 1627037
Reference: U.S. Patent Office, 2002, US Patent 6355259: Cosmetic composition for skin comprising urea, Data Numbering Code: M4.4,M4.9

PMRA Document Number: 1627038
Reference: Wiley & Sons, 2008, Kirk-Othmer Encyclopedia of Chemical Technolog, 5th edition. NY. Willey & Sons, Inc., Data Numbering Code: M4.4,M4.9,M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627040
Reference: Leung, D. Y., Y. Y. Kwong, et al., 2005, Canaliculitis associated with a combined infection of Lactococcus lactis cremoris and Eikenella corrodens, Japanese Journal of Ophthalmology 50(3): 284-5, Data Numbering Code: M4.9

PMRA Document Number: 1627044
Reference: Atapattu, N. S. B. M. and C. J. Nelligaswatta, 2005, Effects of citric acid on the performance and utilization of phosphorous and crude protein in broiler chickens fed rice byproducts-based diets., International Journal of Poultry Science 4(12): 990-993,

PMRA Document Number: 1627045
Reference: Bautista Garfias, C. R., M. T. Arriola Gonzalez, et al., 2003, Comparative effect between Lactobacillus casei and a commercial vaccine against coccidiosis in broilers, Tecnica Pecuaria en Mexico 41(3): 317-327, Data Numbering Code: M9.2.1

PMRA Document Number: 1627046
Reference: Farnell, M.B., A. M. Donoghue, et al., 2006, Upregulation of oxidative burst and degranulation in chicken heterophils stimulated with probiotic bacteria., Poultry Science 85(11): 1900-6, Data Numbering Code: M9.2.1

PMRA Document Number: 1627047
Reference: Goyache, J., A. I. Vela, et al., 2001, Lactococcus lactis subsp. lactis ingection in waterfowl: first confirmation in animals. , Emerging Infectious Diseases 7(5): 884-6, Data Numbering Code: M9.2.1

PMRA Document Number: 1627048
Reference: Heres, L., B. Engel, et al., 2003, Fermented Liquid Feed Reduces Susceptibility of Broilers for Salmonella enteritidis., Poultry Science 82: 603-611, Data Numbering Code: M9.2.1

PMRA Document Number: 1627049
Reference: Heres, L., B. Engel, et al., 2003, Effect of acidified feed on susceptibility of broiler chickens to intestinal infection by Campylobacter and Salmonella., Veterinary Microbiology 99(3-4): 259-67, Data Numbering Code: M9.2.1

PMRA Document Number: 1627050
Reference: Ogawa, T., et al, 2005, Oral immunoadjuvant activity of Lactobacillus casei subsp. casei in dextran-fed layer chickens, British Journal of Nutrition 95, 430-434, Data Numbering Code: M9.2.1

PMRA Document Number: 1627051
Reference: Huang, M. K., Y. J. Choi, et al., 2003, Effects of Lactobacilli and an acidophilic fungus on the production performance and immune responses in broiler chickens, Poult Science 83(5): 788-95, Data Numbering Code: M2.7.2,M9.2.1

PMRA Document Number: 1627052
Reference: Bouzaine, T., R. D. Dauphin, et al., 2005, Adherence and colonization properties of Lactobacillus rhamnosus TB1, a broiler chicken isolate., Letters in Applied Microbiology 40(5): 391-6, Data Numbering Code: M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627053
Reference: Counotte F.H.M., A. Lankhorst and R.A. Prins, 1983, Role of DL-lactic acid as an intermediate in rumen metabolism of dairy cows, Journal of Animal Science 56: 1222-1235, Data Numbering Code: M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627054
Reference: Garriga, M., M. Pascual, et al., 1997, Selection of lactobacilli for chicken probiotic adjuncts., Journal od Applied Microbiology 84(1): 125-32, Data Numbering Code: M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627055
Reference: Judge M.A. and J. Van Eys, 1961, Excretion of D-Lactic acid by humans, Journal of Nutrition 76: 310-313, Data Numbering Code: M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627056
Reference: Nadeau, E. M., D. R. Buxton, et al., 2000, Enzyme, bacterial inoculant, and formic acid effects on silage composition of orchardgrass and alfalfa., Journal of Dairy Science 83(7): 1487-502, Data Numbering Code: M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627057
Reference: Nikoskelainen, S., A. C. Ouwehand, et al., 2003, Immune enhancement in rainbow trout (Oncorhynchus mykiss) by potential probiotic bacteria (Lactobacillus rhamnosus)., Fish and Shellfish Immunology 15(5): 443-52, Data Numbering Code: M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8

PMRA Document Number: 1627058
Reference: Nomura, M., M. Kobayashi, et al., 2005, Phenotypic and molecular characterization of Lactococcus lactis from milk and plants., Journal of Applied Microbiology 101(2): 396-405, Data Numbering Code: M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627059
Reference: Orvin-Mundt, J. and J. L. Hemmer, 1968, Lactobacilli on plants, Applied microbiology 16(9): 1326-1330, Data Numbering Code: M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627060
Reference: Panigrahi, A., V. Kiron, et al., 2004, Immune responses in rainbow trout Oncorhynchus mykiss induced by a potential probiotic bacteria Lactobacillus rhamnosus JCM 1136, Veterinary Immunology and Immunopathology 102: 379-388, Data Numbering Code: M9.2.1,M9.4.1,M9.5.1,M9.

PMRA Document Number: 1627061
Reference: Shannon, A. L., G. Attwood, et al., 2000, Characterization of lactic acid bacteria in the larval midgut of the keratinophagous lepidopteran, Hofmannophila pseudospretella, Letters in Applied Microbiology, 32: 36-41, Data Numbering Code: M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,

PMRA Document Number: 1627062
Reference: Sharma N. et al., 2005, Regulation of pyruvate dehydrogenase activity and citric acid cycle intermediates during high cardiac power generation, Journal of Physiology 562.2: 593-603, Data Numbering Code: M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627063
Reference: Sherwin T., E.W. Simon., 1969, The appearance of lactic acid in phaseolus seeds germinating under wet conditions, Journal of Experimental Botany 20: 776-785, Data Numbering Code: M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627064
Reference: Vazquez, J. A., M. L. Cabo, et al., 2003, Survival of lactic acid bacteria in seawater: a factorial study., Current Microbiology 47(6): 508-13, Data Numbering Code: M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627065
Reference: Campos, C. A., O. Rodriguez, et al., 2006, Preliminary characterization of bacteriocins from Lactococcus lactis, Enterococcus faecium and Enterococcus mundtii strains isolated from turbot (Psetta maxima), Food Research International 39(3): 356-364, Data Numbering Code:

PMRA Document Number: 1627066
Reference: Chen, Y. S., F. Yanagida, et al., 2004, Isolation and identification of lactic acid bacteria from soil using an enrichment procedure., Letters Applied Microbiology 40(3): 195-200, Data Numbering Code: M2.7.2,M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627067
Reference: Hagi, T., D. Tanaka, et al., 2004, Diversity and seasonal changes in lactic acid bacteria in the intestinal tract of cultured freshwater fish, Aquaculture 234(1/4): 335-346, Data Numbering Code: M2.7.2,M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627068
Reference: Health-Canada, Material Safety Data Sheet - Infectious substances., Data Numbering Code: M2.7.2,M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627069
Reference: Klijn, N., A. H. Weerkamp, et al., 1994, Detection and characterization of lactose-utilizing Lactococcus spp. in natural ecosystems., Applied Environmental Microbiology 61(2): 788-92, Data Numbering Code: M2.7.2,M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627070
Reference: Ringo, E. and F. J. Gatesoupe, 1997, Lactic acid bacteria in fish: a review, Aquaculture 160(3/4): 177-203, Data Numbering Code: M2.7.2,M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627071
Reference: Schultz, J. E. and J. A. Breznak, 1977, Heterotrophic bacteria present in hindguts of wood-eating termites [Reticulitermes flavipes (Kollar)], Applied Environmental Microbiology 35(5): 930-6, Data Numbering Code: M2.7.2,M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627073
Reference: Shin, K. H., Y. Lim, et al., 2005, Anaerobic biotransformation of dinitrotoluene isomers by Lactococcus lactis subsp. lactis strain 27 isolated from earthworm intestine., Chemosphere 61(1): 30-9, Data Numbering Code: M2.7.2,M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627074
Reference: Stiles, M. E., 1996, Biopreservation by lactic acid bacteria, Antonie Van Leeuwenhoek 70(2-4): 331-45, Data Numbering Code: M2.7.2,M4.1,M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627075
Reference: Albertini, M. V., E. Carcouet, et al., 2006, Changes in organic acids and sugars during early stages of development of acidic and acidless citrus fruit, Journal of Agricultural Food Chemistry 54(21): 8335-9, Data Numbering Code: M4.2.2,M4.4,M4.9,M9.2.1,M9.4.1,M9.5.1,M9.

PMRA Document Number: 1627076
Reference: Hazardous Substances Data Bank, 2006, Lactic Acid, National Library of Medicine's TOXNET system (http://toxnet.nlm.nih.gov) on June 22, 2007, Data Numbering Code: M4.2.2,M4.4,M4.9,M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627077
Reference: Merck and Co., Inc., 2006, The Merck Index., Data Numbering Code: M4.2.2,M4.4,M4.9,M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627078
Reference: OECD, 2001, Screening Information Data Sheets on Citric Acid, UNEP Publications, Data Numbering Code: M4.2.2,M4.4,M4.9,M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627080
Reference: Heikkila, M. P. and P. E. Saris, 2003, Inhibition of Staphylococcus aureus by the commensal bacteria of human milk, Journal of Applied Microbiology 95(3): 471-8, Data Numbering Code:
M2.7.2,M4.2.2,M4.4,M4.9,M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627081
Reference: Hazardous substance data bank, Data Numbering Code:
M4.2.2,M4.9,M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627082
Reference: Adams, M. R., 1998, Safety of industrial lactic acid bacteria., Journal of Biotechnology 68(2-3): 171-8, Data Numbering Code:
M2.7.2,M4.2.2,M4.4,M4.9,M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627083
Reference: Briarty L.G., Stereological analysis of cotyledon cell development in Phaseolus, Data Numbering Code: M9.2.1,M9.4.1,M9.5.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627084
Reference: Holzapfel, W. H., P. Haberer, et al., 2001, Taxonomy and important features of probiotic microorganisms in food and nutrition., American Journal of Clinical Nutrition 73(2 Suppl): 365S-373S, Data Numbering Code:
M2.7.2,M4.2.2,M4.4,M4.9,M9.2.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627085
Reference: Fitzpatrick, K. C., 2005, Probiotics - Discussion Paper, Report submitted to the Natural Health Products Directorate, Health Canada. Winnipeg, Manitoba, Data Numbering Code: M2.7.2,M4.1,M9.1,M9.2.1,M9.5.2,M9.6,M9.8.1,M9.8.2

PMRA Document Number: 1627087
Reference: Balcazar, J. L., D. Vendrell, et al., 2006, Immune modulation by probiotic strains: quantification of phagocytosis of Aeromonas salmonicida by leukocytes isolated from gut of rainbow trout (Oncorhynchus mykiss) using a radiolabelling assay, Comparative Im

PMRA Document Number: 1627088
Reference: Nikoskelainen, S., S. Salminen, et al., 2001, Characterization of the properties of human- and dairy-derived probiotics for prevention of infectious diseases in fish, Applied Environmental Microbiology 67(6): 2430-5, Data Numbering Code: M9.4.1

PMRA Document Number: 1627090
Reference: Vendrell, D., J. L. Balcazar, et al., 2006, Lactococcus garvieae in fish: a review, Comparative Immunology, Microbiology and Infectious Diseases 29: 177-198, Data Numbering Code: M9.4.1

PMRA Document Number: 1627091
Reference: Bowmer, C. T., R. N. Hooftman, et al., 1998, The ecotoxicity and the biodegradability of lactic acid, alkyl lactate esters and lactate salts, Chemosphere 37(7): 1317-33, Data Numbering Code: M9.4.1,M9.5.2,M9.8.1,M9.8.2

PMRA Document Number: 1627093
Reference: Evans, J. D. and D. L. Lopez, 2004, Bacterial probiotics induce an immune response in the honey bee (Hymenoptera: Apidae), Journal of Economic Entomology 97(3): 752-6, Data Numbering Code: M9.5.1

PMRA Document Number: 1627094
Reference: Milani, N., 2000, Activity of oxalic and citric acids on the mite Varroa destructor in laboratory assays, Apidologie 32(2): 127-138, Data Numbering Code: M9.5.1

PMRA Document Number: 1627096
Reference: Balcazar, J. L., I. de Blas, et al., 2006, The role of probiotics in aquaculture, Veterinary Microbiology 114(3-4): 173-86, Data Numbering Code: M9.5.2

PMRA Document Number: 1627097
Reference: Villamil, L., A. Figueras, et al., 2002, Control of Vibrio alginolyticus in Artemia culture by treatment with bacterial probiotics, Aquaculture 219(1/4): 43-56, Data Numbering Code: M9.5.2

PMRA Document Number: 1627099
Reference: Degens, B. P., L. A. Schipper, et al., 2000, Irrigation of an allophanic soil with dairy factory effluent for 22 years: responses of nutrient storage and soil biota, Australian Journal of Soil Research 38(1): 25-35, Data Numbering Code: M9.6

PMRA Document Number: 1627100
Reference: Duval, J., 1991, Utilisation agricole des residus laitiers, Agro-Biologie 370(7), Data Numbering Code: M9.6

PMRA Document Number: 1766294
Reference: A. Avlami and T. Kordossis and N. Vrizidis and N. V. Sipsas, 2001, Lactobacillus Rhamnosus Endocarditis Complicating Colonoscopy, British Infection Society, Data Numbering Code: 2.7,M9.3

PMRA Document Number: 1766299
Reference: Russell K. Chan and Cora R. Wortman and Brenda K. Smiley and Carol A. Hendrick, 2003, Construction and use of a computerized DNA fingerprint database for lactic acid bacteria from silage, Journal of Microbiological Methods 55: 565-574, Data Numbering Code: 2.7,M9.3

PMRA Document Number: 1766302
Reference: Yunsop Chong and Hwan Sub Lim and Samuel Y. Lee and Seung Yun Cho, 1990, Yonsei Medical Journal, Lactobacillus casei subspecis casei Endocarditis - A case report, Yonsei Medical Journal, 32: 69-73, Data Numbering Code: 2.7,M9.3

PMRA Document Number: 1766312
Reference: David E. Bronstein and Jonathan Cotliar and Jodie K. Votava-Smith and Mark Z. Powell and Marjorie J. Miller and James D. Cherry, 2004, The Pediatric Infectious Disease Journal, Recurrent Papular Urticaria After Varicella Immunization in a 15-month-old Gir

PMRA Document Number: 1766317
Reference: Rola N. Husni and Steven M. Gordon and John A. Washington and David L. Longworth, 1997, Lactobacillus Bacteremia and Endocarditis: Review of 45 Cases, Clinical Infectious Diseases, 25:1048-1055, Data Numbering Code: 2.7,M9.3

PMRA Document Number: 1766323
Reference: P. Kalima and R. G. Masterton and P. H. Roddie and A. E. Thomas, 1995, Journal of Infection, Lactobacillus rhamnosus Infection in a Child Following Bone Marrow Transplant, Journal of Infection, 32: 165-167, Data Numbering Code: 2.7,M9.3

PMRA Document Number: 1766327
Reference: Anjali N. Kunz and James M. Noel and Mary P. Fairchok, 2004, Journal of Pediatric Gastroenterology and Nutrition, Two Cases of Lactobacillus Bacteremia During Probiotic Treatment of Short Gut Syndrome, Journal of Pediatric Gastroenterology and Nutrition, 38(4): 457-458, Data Numbering Code: 2.7,M9.3

PMRA Document Number: 1766332
Reference: Michael H. Land and Kelly Rouster-Stevens and Charles R. Woods and Michael L. Cannon and James Cnota and Avinash K. Shetty, 2004, PEDIATRICS, Lactobacillus Sepsis Associated With Probiotic Therapy, Pediatrics, 115(1):178-181, Data Numbering Code: 2.7,M9.3

PMRA Document Number: 1766342
Reference: Takayuki Nakarai and Katsuya Morita and Yoshifumi Nojiri and Jinichi Nei and Yasuhiro Kawamori, 1999, Pediatrics International, Liver abscess due to Lactococcus lactis cremoris, Pediatrics International, 42: 699-701, Data Numbering Code: 2.7,M9.3

PMRA Document Number: 1766347
Reference: D. Pittet and N. Li and R. P. Wenzel, 1993, Eur. J. Clin. Microbiol. Infect. Dis., Association of Secondary and Polymicrobial Nosocomial Bloodstream Infections with Higher Mortality, European Journal of Clinical Microbiology and Infectious Diseases, 12(

PMRA Document Number: 1766363
Reference: Edsel Maurice T. Salvanaa and Michael Frank, 2005, Journal of Infection, Lactobacillus endocarditis: Case report and review of cases reported since 1992, Journal of Infection, 53: e5-e10, Data Numbering Code: 2.7,M9.3

PMRA Document Number: 1766365
Reference: Chiara Tommasi and Francesco Equitani and Marcello Masala and Milva Ballardini and Marco Favaro and Marcello Meledandri and Carla Fontana and Pasquale Narciso and Emanuele Nicastri, 2008, Journal of Medical Case Reports, Diagnostic difficulties of Lactoba

PMRA Document Number: 1766368
Reference: Frederic Wallet and Rodrigue Dessein and Sylvie Armand, 2002, Clinical Infectious Diseases, Molecular Diagnosis of Endocarditis Due to Lactobacillus casei subsp. rhamnosus, Clinical Infectious Diseases, 35: e117-9, Data Numbering Code: 2.7,M9.3

PMRA Document Number: 1766369
Reference: Martin Wolz and Jochen Schaefer, 2009, American Academy of Neurology, "Swiss cheese like" brain due to Lactobacillus rhamnosus, American Academy of Neurology, 70: 979-981, Data Numbering Code: 2.7,M9.3

PMRA Document Number: 1766371
Reference: L. Ze-Ze and R. Tenreiro and A. Duarte and M. J. Salgado and J. Melo-Cristino and L. Lito and M. M. Carmo and S. Felisberto and G. Carmo, 2004, Journal of Medical Microbiology, Case of aortic endocarditis caused by Lactobacillus casei, Journal of Medical

PMRA Document Number: 1766384
Reference: Canadian Centre for Occupational Health and Safety, 1997, Citric acid, Data Numbering Code: 2.7,9.3,9.4,9.5,9.6,9.7,9.8,M9.2

PMRA Document Number: 1766385
Reference: Canadian Centre for Occupational Health and Safety, 2000, Lactic Acid , Data Numbering Code: 2.7,9.3,9.4,9.5,9.6,9.7,9.8,M9.2

PMRA Document Number: 1766386
Reference: Canadian Centre for Occupational Health and Safety, 2008, Regsitry of Toxic Effects of Chemical Substances: Lactic acid, Data Numbering Code: 2.7,9.3,9.4,9.5,9.6,9.7,9.8,M9.2

PMRA Document Number: 1766619
Reference: Canadian Centre for Occupational Health and Safety, 2008, Regsitry of Toxic Effects of Chemical Substances: Citric acid, Data Numbering Code: 2.7,9.3,9.4,9.5,9.6,9.7,9.8,M9.2

PMRA Document Number: 1767451
Reference: Farina, C., et al, 2001, Lactobacillus casei subsp. rhamnosus sepsis in a patient with ulcerative colitis, Journal of clinical gastroenterology, 33(3): 251-252, Data Numbering Code: M2.7.2,M9.3

PMRA Document Number: 1767455
Reference: Sloss, J.M., Cumberland, N.S., 1993, Deep Seated Infection due to Lactobacillus caseli - case report, JR Army Med Corps, 139: 25-26, Data Numbering Code: M2.7.2,M9.3

PMRA Document Number: 1779127
Reference: Nogales, R. et al., 1999, Feasibility of Vermicomposting Dairy Biosoids Using A Modified System to Avoid Earthworm Mortality, Journal of Environmental Science and Health, Part B, 34(1): 151-169, Data Numbering Code: M8.0,M9.6

PMRA Document Number: 1806707
Reference: Industrial Process of Freeze-Dried Cultures, Data Numbering Code: M2.7

## B. Additional Information Considered - Published Information

### 1.0 Environment

| PMRA No. | Title |
|---|---|
| 1766294 | 2001, Lactobacillus Rhamnosus Endocarditis Complicating Colonoscopy, DACO: 2.7,M9.3 |
| 1766299 | 2003, Construction and use of a computerized DNA fingerprint database for lactic acid bacteria from silage, DACO: 2.7,M9.3 |
| 1766302 | 1990, Yonsei Medical Journal, Lactobacillus casei subspecis casei Endocarditis - A case report, DACO: 2.7,M9.3 |
| 1766312 | 2004, The Pediatric Infectious Disease Journal, RECURRENT PAPULAR URTICARIA AFTER VARICELLA IMMUNIZATION IN A FIFTEEN-MONTH-OLD GIRL, DACO: 2.7,M9.3 |
| 1766317 | 1997, Lactobacillus Bacteremia and Endocarditis: Review of 45 Cases, DACO: 2.7,M9.3 |
| 1766323 | 1995, Journal of Infection, Lactobacillus rhamnosus Infection in a Child Following Bone Marrow Transplant, DACO: 2.7,M9.3 |
| 1766327 | 2004, Journal of Pediatric Gastroenterology and Nutrition, Two Cases of Lactobacillus Bacteremia During Probiotic Treatment of Short Gut Syndrome, DACO: 2.7,M9.3 |
| 1766332 | 2004, PEDIATRICS, Lactobacillus Sepsis Associated With Probiotic Therapy, DACO: 2.7,M9.3 |
| 1766342 | 1999, Pediatrics International, Liver abscess due to Lactococcus lactis cremoris, DACO: 2.7,M9.3 |
| 1766347 | 1993, Eur. J. Clin. Microbiol. Infect. Dis., Association of Secondary and Polymicrobial Nosocomial Bloodstream Infections with Higher Mortality, DACO: 2.7,M9.3 |
| 1766363 | 2005, Journal of Infection, Lactobacillus endocarditis: Case report and review of cases reported since 1992, DACO: 2.7,M9.3 |
| 1766365 | 2008, Journal of Medical Case Reports, Diagnostic difficulties of Lactobacillus casei bacteraemia in immunocompetent patients: A case report, DACO: 2.7,M9.3 |
| 1766368 | 2002, Clinical Infectious Diseases, Molecular Diagnosis of Endocarditis Due to Lactobacillus casei subsp. rhamnosus, DACO: 2.7,M9.3 |

1766369 2009, American Academy of Neurology, "Swiss cheese like" brain due to Lactobacillus rhamnosus, DACO: 2.7,M9.3

1766371 2004, Journal of Medical Microbiology, Case of aortic endocarditis caused by Lactobacillus casei, DACO: 2.7,M9.3

1766384 CCOHS Chemical Name: Citric acid, DACO: 2.7,9.3,9.4,9.5,9.6,9.7,9.8,M9.2

1766385 CCOHS Chemical Name: Lactic Acid , DACO: 2.7,9.3,9.4,9.5,9.6,9.7,9.8,M9.2

1766386 RTECS Lactic acid, DACO: 2.7,9.3,9.4,9.5,9.6,9.7,9.8,M9.2

1766619 RTECS Citric acid, DACO: 2.7,9.3,9.4,9.5,9.6,9.7,9.8,M9.2

1767451 Farina, C., et al, Lactobacillus casei subsp. rhamnosus sepsis in a patient with ulcerative colitis, CAT.INIST - Journal of clinical gastroenterology, vol. 33, no 3, pp 251-252, DACO: M2.7.2,M9.3

1767455 Sloss, J.M., Cumberland, N.S., Deep Seated Infection due to Lactobacillus caseli - case report, JR Army Med Corps, 1993; 139: 25-26, DACO: M2.7.2,M9.3

1779127 Nogales, R. et al., Nogales, R., Elvira, C., Benítez, E., Thompson, R. and Gomez, M.(1999)'Feasibility of vermicomposting dairy, Feasibility of Vermicomposting Dairy Biosoids Using A Modified System to Avoid Earthworm Mortality. J.Environ.Sci. Health, B3

## 2.0 Value

USDA Plant Profile – *Oxalis stricta* (common yellow oxalis). USDA. pp. 6.

USDA Plant Profile – *Trifolium repens* (white clover). USDA. pp 5.

USDA Plant Profile – *Trifolium pratense* (red clover). USDA. pp. 4.

USDA Plant Profile – *Medicago lupulina* (black medick). USDA. pp. 4.

USDA plant profile – *Lotus corniculatus* (bird’s-foot trefoil). USDA. pp. 4.

Wigger, J.W. and B.E. Torkelson. (1997). “Petroleum hydrocarbon fingerprinting – numerical interpretation developments.” Developments, in proceedings, 4th Annual International Petroleum Environmental Conference.

Frère Marie-Victorin, É.C. (1995). “Flore Laurentienne.” Les Presses de l’Université de Montréal. 3rd print. Canada.

AP Group. (2003). “An update of the Angiosperm phylogeny group classification for the orders and families of flowering plants: APG II.” Bot. J. Linn Soc. 141: 399-436.

Core, E.L. (1964). “Plant taxonomy.” Prentice-Hall Inc. Englewood Cliffs. 4th print. N.J.

Judd, W.S. *et al*. (2002). “Botanique Systémique. Une perspective phylogénétique.” DeBoeck Université. Bruxelles.
Lees, G.L. (1984). “Cuticle and cell wall thickness: relation to mechanical strength of whole leaves and isolated cells from some forage legumes.” Crop Sci. **24**: 1077-1081.

Bellarmino, A. et al. (1999). “Aspects of leaf anatomy of Kudzu (Pueraria lobata, leguminosae-Faboideae) related to water and energy balance.” Pesq Agropec bras Brasilia. **34**(8): 1361-1365.

Richardson, B.M. et al. (2006). “Postemergence oxalis control with Diuron: minimizing crop injury with timely irrigation.” J Environ Hort. **24**(3): 129-132.