Immune+™
Immunoglobulin for Health and Vigour

Riddet Institute
FOOD | INNOVATION | HEALTH
IMMUNOGLOBULINS

Immunoglobulins (Ig) are glycoproteins produced by plasma cells (or B lymphocytes) in response to antigens.

Major functions of Ig

— bind to invading pathogens
— activate specific functions
— prevent infection and disease caused by pathogens.
Riddet Institute Research on Immunoglobulins

The Riddet Institute has developed a novel process for the separation and purification of immunoglobulins (Immune+™) from lamb's blood. Research carried out at the Riddet Institute has found that feeding the freeze-dried ovine serum Ig to the normal and pathogen infected rat has a number of health benefits:

- Superior growth performance
- Selectively enhanced immunity
- Selective alteration to the composition of gut microbiota (up regulating good bacteria and preventing bad pathogens)
- Selective modulation of the gut mucin concentration - improved gut barrier function.

Why Immune+™

- Completely natural Immune+™ is extracted from New Zealand lamb/sheep (raised in clean and green New Zealand pastures).
- Cheap consistent supply of raw material (New Zealand lamb/sheep population is very large - 70-80 million are processed annually)
- BSE (Bovine Spongiform Encephalopathy) free
- Special value placed on lamb products by the world market, all make Immune+™ extracted from New Zealand lamb blood an attractive package almost impossible for any other country to duplicate
- Proven to retain biological activity in the digestive tract.

Application in Companion Animals Food

- Fortifying pet food with Immune+™ for superior dental health and immunity in cats
- Proven in a cat trial at the world class Feline Research Unit, Massey University (Patent pending).

What's on offer

The Riddet Institute is seeking expressions of interest for commercial partnership with end users who may like to use ovine Ig as an ingredient in their food product range for production and companion animals.

New Zealand meat companies have expressed interest in large scale production of ovine Immunoglobulin should there be interest from end users.
DEEP DIVE INTO Immune+™

HEALTH BENEFITS IN HUMANS

IMMUNITY BOOSTING

- For athletes
- For weight trainers/body builders
- For immunocompromised patients (with HIV).

HELP TO ACHIEVE PEAK STRENGTH, FITNESS AND VIGOUR

- Help in increasing the energy level
- Supporting healthy gut function by promoting good bacteria and preventing pathogens
- Prevention of diarrhoea (infants to elderly)
- Supporting gut barrier function (mucin)
- Speedy recovery after antibiotic treatment
- Reducing total Cholesterol and LDL in hypercholesterolaemic patients
- Protein Supplementation
- Senior (elderly) nutrition
- Helping to improve the absorption of vitamins and minerals
- Supporting oral health.

HEALTH BENEFITS IN ANIMALS

- Improving feed intake, body weight gain, intestinal growth3–12
- Boosting health during weaning
- Supporting good bacteria and preventing pathogen growth (prophylactic for diarrhoea)3,5,6,10
- Resistance to infection by enhancing the gut mucosal barrier3,5,6,10
- Supporting overall immunity (gut and peripheral)3,4,8,9
- Improving oral health3
- Helping to improve the absorption of vitamins and minerals3
- Speedy recovery after antibiotic treatment3

5 Balan P et al., (2012). Orally administered ovine serum immunoglobulins modulate the level of lactobacilli and enterobacteria in the growing rat (Submitted for publication).
9 Balan P et al., (2012). Ovine serum immunoglobulin supplements prevent the release of mucosal proinflammatory mediators in the growing rat challenged with Salmonella enteritidis (Submitted for publication).
10 Balan P et al., Stimulatory effect of ovine serum Ig on multiplication of lactic acid bacteria under in vitro condition (Manuscript).
RIDDETT INSTITUTE RESEARCH ON IMMUNOGLOBULINS: RODENT MODEL

IN NORMAL RATS
- ↑ in growth
- ↑ in gut weights
- Enhanced gut architecture

IN INFECTED RATS
- ↑ of 250% in daily weight gain
- ↑ in gut weights
- Enhanced gut architecture

IN NORMAL RATS
- ↑ of 42% in phagocytic activity of leukocytes
- ↑ of 400% in spleen lymphocyte proliferation
- ↑ of 40% in cytokines
- Increase of serum IgA and gut IgG & IgA levels

IN INFECTED RATS
- ↑ in good bacteria such as Lactobacillus species in gut

IN NORMAL RATS
- Phagocytic activity of leukocytes
- Spleen lymphocyte proliferation
- Anti-inflammatory cytokines
- Pro-inflammatory cytokines
- ↑ gut and plasma Salmonella specific IgA & IgG

IN INFECTED RATS
- ↑ good bacteria such as Lactobacillus, and Leuconostoc, Weissella species in gut
- ↑ bad bacteria such as Salmonella species in gut

IN NORMAL RATS
- ↑ of stomach and gut mucin genes
- ↑ of 50 to 100% mucous goblet cells
- ↑ of 100% intestinal mucin protein

IN INFECTED RATS
- ↑ of 100 to 200% mucous goblet cells
- ↑ of 220% intestinal mucin protein

IMMUNITY

MUCIN

GROWTH

MICROBIOTA
RIDDET INSTITUTE RESEARCH ON IMMUNOGLOBULINS IN CATS

— Recently Riddet Institute, has successfully completed a cat study to evaluate the effects of Immune+ supplementation on dental health and immunity in cats.

— Trial was carried out in the world class feline research unit, Massey University, New Zealand.

— Total of 30 cats were used in the trial and the study was conducted for 7 weeks.

— Two experimental diets were investigated:
  > (1) commercial dry biscuits (control) and
  > (2) commercial dry biscuits sprayed with an Immune+ (treatment)

— Plaque scores and immune profiles were tested before and after the treatment.

Very positive result

— Immune+ supplementation resulted in
  > a huge reduction in dental plaque
  > Significant reduction in salivary and serum IgA and IgG levels.
ABOUT RIDDET INSTITUTE

RIDDET INSTITUTE CO-DIRECTORS

Distinguished Professor
Paul Moughan
PhD DSc, FRSNZ

Professor Harjinder Singh
PhD, FRSNZ, FAIOStT

The Riddet Institute is a national Centre of Research Excellence. The institute has world-class competency in the areas of biomaterials science and digestive physiology relating to nutrient absorption and metabolism. The Institute is a partnership between Massey University, University of Otago, The University of Auckland, AgResearch and Plant & Food Research. It is funded by New Zealand government and also earns income from the domestic and international food industry.

RESEARCH TEAM FOR Immune+™

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Dr Shane M Rutherford
PhD

World leading nutrition scientist with over 300 peer-reviewed publications and 3 patents. Professor Moughan is a highly cited researcher.

Experienced pharmacologist and immunonutritionist.

Experience biochemist and nutritionist. Dr Rutherford has published over 75 peer-reviewed publications.

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2012-08-01