

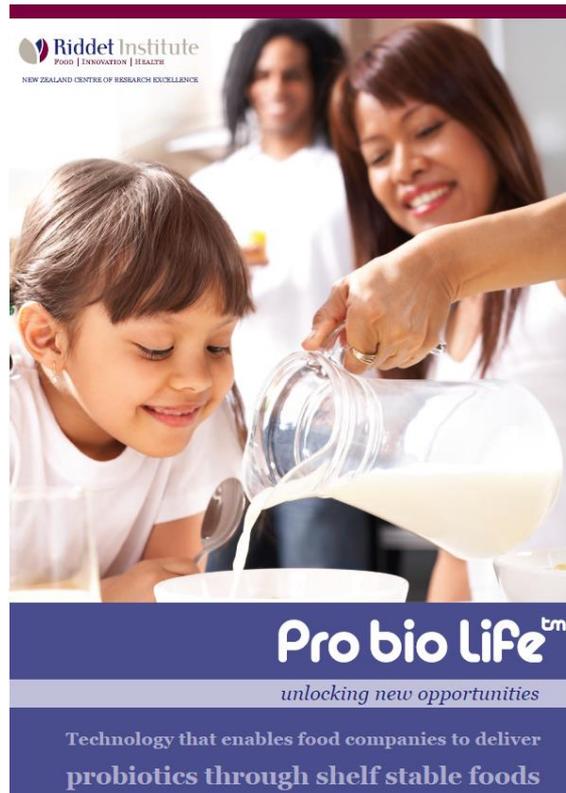
The Riddet Institute, hosted by Massey University, is a premier national centre for fundamental and strategic scientific research in food material science, gastrointestinal biology and human nutrition. Awarded Centre of Research Excellence (CoRE) status by the New Zealand Government in 2007, the Riddet Institute provides a unique intellectual environment using a multi-disciplinary scientific approach and integrating New Zealand's expertise across multiple organisations, including Massey University, University of Auckland, University of Otago, AgResearch and Plant & Food Research. The Institute is internationally acclaimed and led by scientists of international renown.

The research outcomes from the Riddet Institute include international patents and peer-reviewed high-quality publications. Our patented technologies are often commercialised by industry, and we have many successful partnerships to translate our science into products. One of these partnerships is the [Alpha-Massey Natural Nutraceuticals Research Centre](#), which was established in 2016 to support Alpha Group's interests in evaluating new goods and botanicals with evidence-based health properties, leveraging off the world-class research capability of the Riddet Institute. Products developed to date by the Alpha-Massey partnership are summarised in this brochure.



## 1. Probiolife™

Probiotics are live microorganisms, which if consumed in recommended quantities, confer distinctive health benefits to the host. The survival of probiotics during a product's shelf-life is of vital importance. Most products need to be chilled to deliver the probiotics to the consumer and often the bacteria do not survive at room temperature. The delivery of probiotics in a shelf stable format has been difficult until now. The Probiolife™ technology, developed by the Riddet Institute, on having global patent protection, is a new way of increasing levels of probiotics into a range of shelf-stable foods. The benefits of probiotics can then be available to millions of consumers worldwide, where there is often no access to a chilled supply chain. Probiolife™ is about maximising the efficacy of probiotics.



The Probiolife™ technology is the result of extensive research carried out at the Riddet Institute over the last 10 years. More details of this research programme and the output; multinational patent and scientific publications in highly rated journals can be accessed publicly [1-4].

The first prototype using the Probiolife™ technology has been transferred to Alpha Group Holdings Ltd. for product development. The product is intended to benefit the consumer by improving gut health. The product includes three bacterial strains: *Bifidobacterium lactis* UBBLa-70, *Lactobacillus acidophilus* UBLA-34, and *Lactobacillus rhamnosus* UBLR-58.

## 2. The TurMerit-NZ™ Lozenge

Have you ever suffered from a sore throat? Have you used honey with its antibacterial and anti-inflammatory effects to help soothe it? The Riddet Institute has developed a unique combination of curcumin, New Zealand Manuka honey and whey protein (TurMerit-NZ™ Lozenge) to alleviate sore throat symptoms and to provide protection. Curcumin is traditionally consumed for its antioxidant and anti-inflammatory properties. Manuka Honey has high amounts of methylglyoxal, which has been identified as a bioactive compound responsible for the honey's antibacterial, and wound healing activity. Whey protein Isolate extracted from cow's milk has the unique property of allowing the ingredients to stick to the mucosal surfaces in the mouth [5]. This helps prolong retention time and increase the effectiveness of the lozenge.

Sore throat or strep throat, also known as streptococcal sore throat, is an infection of the throat and tonsils caused by a bacterium called *Streptococcus pyogenes*. Our research has found that a unique combination of curcumin, Manuka honey and whey protein has antimicrobial activities against ten bacteria (*Bacillus subtilis*, *Listeria monocytogenes*, *Streptococcus pyogenes*, *Staphylococcus aureus*, *Escherichia coli* NCTC 10863, *Escherichia coli* O157:H7CDC strain G5244, *Proteus vulgaris*, *Shigella sonnei* *Salmonella enteritidis* and *Salmonella typhimurium*) [6]. In this study, the *Streptococcus pyogenes* bacterium was completely inactivated (100% efficacy) by our unique combination of ingredients.

### **3. Meat Hydrolysate (MEAT-ZEALAND™)**

As we age, we lose muscle, and this can lead to advanced sarcopenia in older adults. Adequate dietary protein is crucial as we progress through different life stages. Humans need all 20 amino acids (that make up body proteins) to be healthy – some are made within our bodies, but others must come from the food we eat. For most older adults, a dietary strategy which provides enough well-balanced protein is a practical approach to ensure adequate amounts of the essential amino acids for protein, and the alleviation of muscle loss. Research suggests that protein supplementation may be beneficial for people suffering from muscle loss or sarcopenia.

Nutrient-rich protein sources such as red meats are less digestible when provided intact to older adults. Protein hydrolysis or breakdown is one method for increasing access to the nutrients in these foods. Meat that has been hydrolysed or broken down, is soluble (so does not require chewing), and allows for the preparation of a savoury-soup or broth, which can be easily ingested and digested [7].

At the Riddet Institute, we have developed a process for hydrolysing lamb meat, and this is the basis of MEAT-ZEALAND™. Clinical trials with adults have been undertaken at the Riddet Institute. In addition to the good taste, our clinical data showed that the protein in a soup was nearly completely absorbed from the digestive tract and was utilised by the body very effectively [8]. The protein utilization value was higher than that of milk, known to be a highly available source of protein. As a nutritional supplement, MEAT-ZEALAND™ can help support the prevention of skeletal muscle protein loss that occurs with ageing, by delivering nutrients in a digestible format for this age group. A manufacturing process has been developed which leads to a great tasting liquid soup, with high rates of absorbable and utilisable protein.

### **4. Coenzyme Q10 delivery**

Consumers are becoming more conscious of their health and have started looking for functional foods that provide health-promoting effects beyond their nutritional value. These foods commonly contain substances such as bioactive proteins, peptides, phytochemicals, fatty acids and micronutrients that can exert a biological function. Coenzyme Q10 (CoQ10) is a naturally occurring bioactive compound that works on energy supply in our cells. It is believed that CoQ10 supplements bring health benefits to the heart, brain and muscles where high energy supply is required.

CoQ10 is an ingredient that cannot simply be added to current foods because of its low solubility. At the Riddet Institute we recently developed a way to dissolve it in common food structures, which allowed us to design a high-protein functional beverage containing CoQ10. Our *in vivo* studies indicate that the beverage can significantly improve (2.8-fold) the oral

absorption of CoQ10 compared with the conventional way of CoQ10 supplementation (i.e. CoQ10-loaded oil) [9]. This technology enables effective COQ10 delivery.

CoQ10 is also an important antioxidant that may prevent reactive species (i.e. free radicals) from being formed or remove them before they can damage vital components of the cell. Therefore, it is believed to protect cells against oxidative damage. The technology that the Riddet Institute has developed can be easily adapted to formulations for other systems with a similar structure (e.g. creams and lotions). The Alpha Group is investigating our technology for use in other applications. Much of our work on CoQ10 delivery has been undertaken in conjunction with , and co-funded by the New Zealand High Value Nutrition – National Science Challenge.

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位于新西兰梅西大学的 Riddet 研究所是一家全国领先并在世界享有盛誉的致力于食品和营养科学的研究机构，其于 2007 年起入选新西兰“最杰出研究机构” (CoRE) 之一。Riddet 研究所整合了新西兰多家高校和研究型企业的智力资源，其科研人员来自梅西大学、奥克兰大学、奥塔哥大学、AgResearch 和 Plant & Food Research，并横跨与食品和营养相关的多个学科。

Riddet 研究所拥有大量国际专利、高水平论文等科研成果，我们的很多专利被企业收购并产业化。在我们众多的产业合作中，成立于 2016 年的梅西大学安发天然营养研究中心是重要的伙伴之一。这项合作旨在利用 Riddet 研究所世界领先的科研实力，帮助安发国际集团开拓基于食品科技的新的商业机会。截至目前，该项合作已完成或在研的项目有：

### 1. Probiolifetm 益生菌

学界认为，一定量的补充益生菌可以改善胃肠道健康。然而益生菌是活的微生物，在室温下长久存放会失活，因而需要冷链保藏，这是国际食品学界一直以来的技术难题，为益生菌类产品的产业化带来诸多不便。我们的 Probiolifetm 技术很好地解决了这一难题，并在新西兰、澳洲、新加坡和中国注册了国际专利。这项技术允许生产商将益生菌产品带到世界上没有冷链供应的国家和地区，从而让益生菌产品造福更多人群。Probiolifetm 技术由 Riddet 研究所历经 10 年努力研发而来，关于该技术的更多细节请查阅文献 [1-4]。目前安发国际集团正在开发基于该技术的第一款益生菌产品，产品包含了 *Bifidobacterium lactis* UBBLA-70, *Lactobacillus acidophilus* UBLA-34, 和 *Lactobacillus rhamnosus* UBLR-58 三种益生菌，用于改善肠道健康。

### 2. TurMerit-NZtm 含片

Riddet 研究所研发了一种含有姜黄素、新西兰麦卢卡蜂蜜和乳清蛋白的含片 (TurMerit-NZ™)。在传统意义上，姜黄素被认为具有抗炎和抗氧化的活性，麦卢卡蜂蜜具有抗菌和促进伤口愈合的作用，而牛乳清蛋白对口腔粘膜具有一定吸附性 [5]，可延长其他活性成分和口腔粘膜的作用时间。我们的研究发现这个独特的组合可以有效抑制 10 种细菌 [6]，其中产脓链球菌受到了彻底的抑制 (100%抑制)。咽喉痛是一种主要由链球菌引起的喉和扁桃体感染，这款含片可缓和咽喉痛等症状。

### 3. MEAT-ZEALANDtm 水解羊肉

充足的蛋白质摄入可以有效补充人体健康所需的 20 种氨基酸。对中老年人而言，充足的蛋白质摄入还可避免肌肉流失以及肌肉衰减综合征 (sarcopenia)。然而，牛羊肉等红肉虽然是营养价值很高的蛋白食物来源，但对于中老年人而言这些肉类较难消化和吸收。Riddet 研究所研发了一种技术可将羊肉水解至可溶，并可调制无需咀嚼即可饮用的美味蛋白汤。我们的临床实验显示，这些水解后的羊肉蛋白可完全被成年人消化道吸收 [7-8]，并用于人体蛋白合成，其吸收效率甚至高于牛奶——一种被普遍认为可以高效吸收的蛋白来源。作为一种营养补充剂，MEAT-ZEALANDtm 可以用于调制可口的蛋白汤，为特定年龄群体补充易消化吸收的必需营养，延缓年龄增长造成的骨骼肌肉蛋白流失。

### 4. 辅酶 Q10 补充剂

随着人们对健康的日益重视，消费者对功能性食品的需求也渐多。这些食品通常含有生物活性物质，不仅能像其他食品一样为人体提供必需的营养，还有助于改善人体生物学机能。辅酶 Q10 是一种人体能量供应链中必需的生物活性物质，一般认为，适量补充辅酶 Q10 对心、脑

和骨骼肌等对能量需求较大的组织有改善作用。由于水溶性和稳定性差，辅酶 Q10 无法直接添加至食品中。Riddet 研究所研发的一项技术可提高辅酶 Q10 溶解性，并添加至特制的高蛋白功能饮料中。动物活体实验证明，与市场上现有的辅酶 Q10 补剂相比，我们的功能饮料可将辅酶 Q10 的口服吸收率提高 2.8 倍 [9]!

辅酶 Q10 同时也是一种强效的抗氧化剂，可以清除自由基从而减少其对细胞造成的损伤。Riddet 研究所研发的辅酶 Q10 递送技术亦可用于开发其他具有类似结构的产品，如护肤液等。安发国际集团正基于该项技术进行其他方向的产品开发。