**Milk science finds answers to global nutrition concerns
Research identifies bioactive components that support diet, health and demographic growth**

New discoveries within milk science are revealing untapped opportunities to relieve some of the world’s most pressing nutritional challenges.

Many point to future ingredient solutions, calling for technology that can both extract tiny amounts of bioactive components from bovine milk and maintain their beneficial bioactivity during processing into commercial products.

“Among the big challenges are obesity, diabetes and food security for the growing global population. As the only product made by nature for consumption, milk is the best place to learn about optimal nutrition,” says Peter Langborg Wejse, senior food scientist at Arla Foods Ingredients.

His comment follows the 2014 symposium of the International Milk Genomics Consortium (IMGC). Held over three days, the annual event gathered more than 120 university and industrial scientists from 17 countries at Aarhus University in Denmark. Arla Foods Ingredients was among the sponsors.

**Findings from cow to wallaby milk**The presentations covered the latest research ranging from the role of genomics in sustainable dairy production to how insights into wallaby milk may contribute to optimised nutrition for pre-term infants.

“IMGC is a pre-competitive platform for understanding and accelerating the biological processes underlying milk genomics and translating that knowledge into something industry can use,” says Gonca Pasin, executive director of the California Dairy Research Foundation, which has managed IMGC since its inception in 2004.

**Current developments**Wejse, too, is confident that the research will lay the foundations for developing more, highly specialised bioactive ingredients derived from whey.

Arla Foods Ingredients took a significant stride in this direction with the launch of the first commercially available osteopontin – Lacprodan® OPN-10 ­– for infant formulas. A glycoprotein identified in human milk but present in bovine milk at a much lower level, OPN is believed to support the development of the infant immune system and protect against pathogenic infections.

Today, attention is on oligosaccharides, which promote the development of healthy gastrointestinal bacteria.

“In human milk, the level of oligosaccharides is around 10 times higher than in bovine milk,” Wejse says. “Although several commercial oligosaccharide products are available, none of them are extracted from milk. At Arla Foods Ingredients, we follow the research in milk-derived oligosaccharides with great interest.”

**Tomorrow’s ingredient?**One highlight of the 2014 IMGC symposium was a presentation on micro ribonucleic acid (miRNA), another important component of human milk. Although its function is not yet clear, there are indications of a role in the regulation of the immune system or metabolism. MiRNA has also been isolated in bovine milk.

“This is inspiration that, one day, could be translated into a new Arla Foods Ingredients product,” Wejse remarks.

**Success through collaboration**Gonca Pasin is encouraged by the increasing amount of today’s milk genomics research that is conducted by IMGC members in collaboration.

“We measure our success by the level of collaboration and co-publication between IMGC participants. Since we started in 2004, co-publication has increased 25-fold and the number of publications in the field by 1100%,” she states.

This work is mapping the functionality of milk as a food, medicine and hormonal signal. An impressive bank of knowledge already exists, of value to diet and health across all age groups.

For more information about milk genomics, visit milkgenomics.org or contact ingredients@arlafoods.com.