



A novel assay for the production of safer, healthier foods

A new analytical method reveals that a specific class of molecule arises within processed foods that plays a key role in triggering the risk factors that lead to heart disease, diabetes and obesity

- Means to produce healthier foods
- Opportunity to develop premium products
- Potential for positive media attention

Challenge

The food industry is under increasing pressure to improve the health-profile of processed foods, which currently face negative press due to their potential to increase risk of heart disease, diabetes and obesity. At the same time, consumer awareness of the links between diet and health, and demand for healthier convenience foods, is increasing rapidly.

Solution

Pathogen-associated molecular patterns (PAMPs), have been discovered to play a key role in connecting processed food intake with disease. Our assay can help manufacturers produce low PAMP foods to satisfy demand from health-conscious consumers.

Crucially, our research shows that it is possible to produce processed foods using the same ingredients and equipment, but in a manner that minimises the accumulation of these molecules, at little or no additional cost to the producer or consumer.

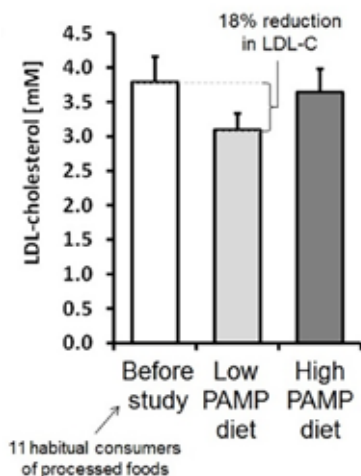


Figure 1: Dietary Studies have shown that low-PAMP diets reduce markers of inflammation and LDL-cholesterol significantly in man (Herieka et al. Nutr Metab Cardiovasc Dis, 2016)

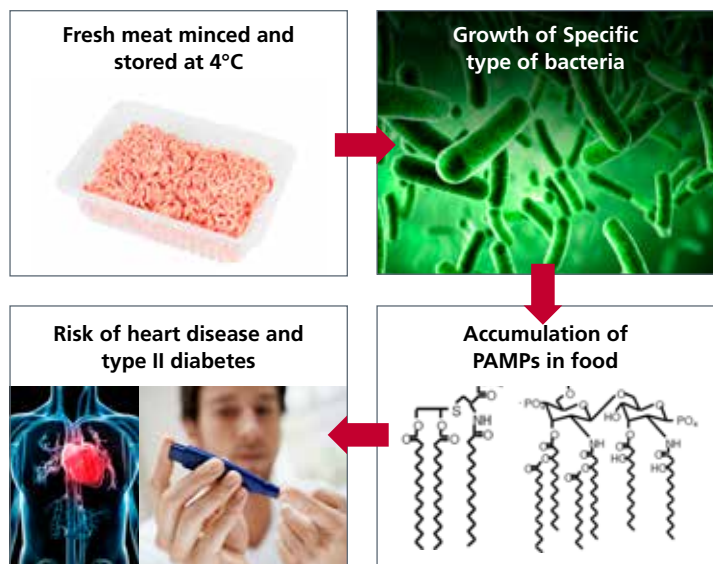


Figure 2: Accumulation of PAMPs in processed food and associated risk with disease

Product description

PAMPs are immunostimulatory molecules which arise in processed foods as a result of the activity of specific types of non-pathogenic bacteria, but not commonly used fermentative or probiotic bacteria. Researchers at The University of Leicester have discovered that these PAMPs are, unlike the bacteria that produce them, resistant to cooking and may be absorbed from the gut to trigger inflammation and changes to metabolism that increase risk of disease.

Dietary studies in human volunteers showed that removing PAMPs from the diet reduces levels of LDL (bad) cholesterol, inflammatory markers, body weight and waist circumference, in as little as 7 days. Together, the observed changes were equivalent to a ~15% reduction in risk of type II diabetes, and a ~40% reduction in risk of coronary artery disease. Switching to a high PAMP diet reversed these effects within just 4 days (Herieka et al. Nutr Metab Cardiovasc Dis, 2016).

Food-borne PAMPs cannot be quantitated using existing assays, such as culturing, colony counting, limulus assays, ELISA or HPLC. Instead, an in vitro assay has been developed which reliably quantifies the PAMP content of foodstuffs and predicts their inflammatory potential, independently of microbial viability (Erridge C. Br J Nutr, 2010). The assay can be used to help manufacturers identify sources of PAMP contamination of their food products, through screening ingredients to identify the best suppliers, and highlighting issues with in-house processing machinery. Regular screening should enable the production of low-PAMP equivalents of convenience foods, using otherwise identical ingredients, machinery and processing techniques.

IP status

The use of PAMP testing to improve the health profile of foods is covered by patents granted in the UK (GB2481267) and US (US9249471).

Benefits

- A low PAMP diet has been shown to reduce LDL-cholesterol, body weight and waist circumference in published human dietary studies, which received much interest from mainstream media.
- Unlike any available alternative, the assay detects the full range of structurally diverse PAMPs within the class responsible for the induction of inflammation and disease risk, even after cooking or other processing techniques has killed cultivable bacteria.
- The assay can be applied to help manufacturers produce healthier foods using the same ingredients and machinery at little additional cost.
- Low PAMP foods can be produced while retaining identical taste, appearance and texture.
- Strong interest in the potential health benefits of low PAMP foods is expected from the general public and regulators in future.

Market

- Consumer awareness of the links between diet and health are increasing, driving a rapidly expanding market for healthier foods.
- Global sales of functional and health-promoting foods are expected to exceed \$1 trillion in 2017, with CAGR of 5.8%.
- As obesity, diabetes and heart disease become greater burdens on national systems of healthcare, regulators may request routine PAMP testing in future.

Find out more

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