On the pulse - enhancing the quality of grain protein for future food

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There is a growing demand for plant-based protein sources to meet future global nutritional requirements. Pulses provide protein, fibre and nutrient-dense seeds and are an excellent source of bioactive components that can have positive health outcomes, controlling cardiovascular disease, diabetes, and obesity. Soy has been a mainstay of the plant protein ingredient market, but new plant protein sources are emerging. For instance, mung bean is a vitamin-rich legume that offers unique functionality including emulsification and gelling properties and hence has seen use as an egg alternative. Likewise, chickpeas are a popular protein source for many people and in many cuisines. Chickpea has seen recent application as an emulsifier, as an ingredient in both hot and cold beverages based on its neutral flavour, viscosity, and mouthfeel. Another example is lupin whose seeds possess high protein content and can lower cholesterol and blood pressure. Despite their potential and the health-enhancing properties of the seedborne proteins, pulses remain under-utilised as a human food, in part due to food allergies or intolerances. Food processing treatments, including protein fractionation, isolation or modification including via microbial fermentation can reduce or degrade allergenic proteins, toxic components (like alkaloids) or carbohydrates (like raffinose) and thus play a role in the development of innovative plant-based food products. The opportunity exists to select pulses to meet specific end use applications, to inform breeding programs to enhance food related traits, or to apply processing steps or treatments to enhance the final products.