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DEVELOPMENT OF A WHEY
PROTEIN-ENRICHED ORANGE DRINK
FOR THE JAPANESE MARKET

A Thesis presented in partial
fulfilment of the requirements
for the degree of Master of
Philosophy in Food Technology
at Massey University.

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ABSTRACT

A whey protein fortified orange beverage was developed for the Japanese market as a result of this project.

Whey protein concentrates are unique protein ingredients with high nutritional values and varied functionality. They are produced in New Zealand in increasing quantities and, as they are not fully utilised in Japan, the Japanese market is seen as a major potential outlet.

Product idea generation techniques were used to create a range of 66 new product ideas for the Japanese market, incorporating whey protein concentrates. After screening, the most promising new product idea was a protein enriched orange juice. The concept of a health food drink enriched with whey protein and vitamin C was developed.

Functionality of the whey proteins in whey protein concentrates (WPC) was studied in a model orange juice system. High protein WPCs were more stable than low protein WPCs in view of serum formation. However, both high and low protein WPCs needed citric acid/sodium citrate to prevent serum formation on storage. Pectin had to be added to give enough heat stability so that the drink could be UHT processed. A pH less than 4 was necessary to give enough sourness to the drink and also for heat stability. Sulphuric WPC gave a more acceptable flavour in the final drink than lactic WPC.

Two market trials and storage tests were carried out on the drinks from the pilot scale production runs. The first trial indicated a need for flavour and colour improvements, which led to the second trial.

From the results of the second trial, some minor reformulation to improve the flavour and the viscosity of the drink is still required. None the less, the product has a considerable market potential for utilizing the whey protein concentrate, in the order of 600 tonnes/year.

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