

# Prototype Development of Avocado-Powder based Food Concepts

## CHOCOLATE BREAKFAST (DRINK)



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## 3.0 Prototype Development

### 3.1 Chocolate flavoured Breakfast Drink

#### 3.1.1 Product Background

OVĀVO's marketing idea behind developing a breakfast drink with avocado powder was to promote the perceived health benefits of fats and fibre. Chocolate flavoured beverages were developed as it was thought that the strong colour and flavour characteristic of chocolate would mask any potential effects of oxidative browning introduced from the avocado powder. Therefore, addition of the powder to chocolate flavoured breakfast beverages will promote satiety as well as mask any oxidative browning from the powder.

#### 3.1.2 Prototype Development

The methodology for developing the prototype was acquired from (Jeličić et al, 2008) and can be found Appendix A. A generic chocolate flavoured high protein beverage was formulated with avocado powder as a functional ingredient. Generally, the prototype was aimed to have 1% fat and 8.0% protein. 250g of liquid with 2g of avocado powder, corresponding to 1.8% avocado powder was sheared in the Silverson L4RT High Shear Mixer at 2500RPM for approximately 5 minutes. Emulsor screen fitting was used for all prototype development

Table 1 shows the ideal composition of the beverage with added avocado powder. Ideal addition rates were between 0.8%-1.2%, corresponding to 2g-3g of powder in 250g of liquid. Table 2 is the estimated nutrition information panel (NIP) of the final product.

*Table 1. Ideal formulation of breakfast beverage*

<b>Ingredients</b>	<b>Composition (%)</b>
Low-Fat Milk, 2% Fat	47.25
OVĀVO Avocado Powder	1.80
Calcium Caseinate	7.41
Cocoa Powder	1.02
Sucralose	1.51
λ-Carageenan	0.01
Microcrystalline Cellulose, MCC	0.13
Carboxymethylcellulose, CMC	0.13
Water	40.73

*Table 2. Nutrition Information Panel for breakfast drink*

<b>Nutrient</b>	<b>Reference value (per 100g)</b>
Energy (kJ)	272.8
Protein (g)	9.8
Total Fats (g)	1.6
- Saturated fats (g)	0.5
Carbohydrates (g)	2.4
Sodium (mg)	22.1

For the focus groups, chocolate flavoured Up&Go™ was combined with 2% avocado powder, in the Silverson L4RT High Shear Mixer, using the emulsor screen. This was to allow ease of preparation and ensure safe consumption. Table 3 below shows the composition of the formulation that was served during the focus groups. The formulation was sheared at 6500RPM for 1.5 minutes. Appendix A details the methodology of development.

*Table 3. Composition of final formulation for breakfast beverage served in focus group*

<b>Ingredients</b>	<b>Composition (%)</b>
Sanitarium, Up&Go Chocolate	98.2
OVAVO, Avocado Powder	1.8

### *3.1.3 Effects of avocado powder inclusion to chocolate flavoured breakfast drinks*

The addition of avocado powder to liquid starting at 1% increased product viscosity to a spoonable, thick consistency. A combination of water and low-fat milk in different ratios aided in the mitigation of increased viscosity, without compromising creaminess and fat content. The natural colour of chocolate beverages was advantageous in masking any surface level oxidation from the avocado powder.

The powder addition increased pH to 6.5 from the control sample pH of 6.3.

## 4.0 Focus Group Study

### 4.1 Objective

The objective of this element of project was to understand how well an avocado powder would be received by consumers by itself and in prepared applications. Prototype products were developed and presented to avocado consumers in focus group discussions to gather a broad range of consumer opinion on the prototypes, as well as further insights into potential avocado powder-containing products.

Twenty-four (24) regular avocado consumers aged 18 to 65 were recruited from the Palmerston North community to participate in focus group discussions (5 to 7 per focus group) for one 90 minute discussion & tasting. This was conducted through FEAST, Massey's sensory professional team.

## 4.3 Results

### 4.3.1 Participant avocado consumption habits

Consumption habit discussion summarised in detail in Table 4, which is ordered from left to right of most frequently mentioned to least frequently mentioned. Key themes included highest consumption of avocado during the season “when the price is low”, with most participants purchasing from the supermarket. Whilst some participants reported consuming avocado on its own “as a fruit”, the majority reported consuming avocado in combination with other foods, which included on toast, in sushi, or “as a smoothie”. Participants generally consumed avocado because it is healthy, with many mentioning “healthy fats”. Other important reasons were “good taste”, “good texture” and “satiating”. Another key insight was that purchase of NZ grown avocados was appealing to many participants due to the environmental impact of imported avocados and avocado plantations in South America.

*Table 4. Participant avocado consumption habits based on all focus groups*

Section	Individual terms used by participants
Frequency	1-2 times a week, when in season, once in 2 weeks, once a month,
Purchase Location	Supermarket, Fruit and vegetable shop, farmers market, own garden
Usage occasion	Guacamole, toast with eggs, bacon, tomatoes, on its own, with honey/sugar/salt/soy sauce/vinegar/wasabi/sesame oil, in salad, as a smoothie, kebab, sushi, avocado oil
Reasons for consumption	Healthy, healthy fats, tasty, satiating, mild flavour, locally produced, substitute for dairy/butter, in sandwich, good protein, neutralises strong flavours
When	Breakfast, Snack, Lunch, Dinner

#### 4.3.2.5 Breakfast drink

Participants evaluated the product’s appearance similar to Up&Go chocolate milk while some reported it similar to drinkable yoghurt. Regarding texture, there was a difference of opinions with some acknowledging it to be thick and viscous while some reported it to be thin and not very mouth-coating. In terms of flavour, participants found the lack of avocado taste to be appealing, preferring the chocolate-milk flavour. Participants suggested to reduce viscosity and sweetness levels in the product. Furthermore, addition of different flavours such as banana or coffee would be preferred, as a refreshing drink.

## 5.0 Recommendations

### 5.1 Breakfast Drink

Shear the mixture using Silverson L4RT High Shear Mixer at 4500 RPM for 1.5 minutes. Mixing the dry ingredients thoroughly before incorporating the wet ingredients ensures complete dispersion.

Above 1.2% inclusion of avocado powder, factors such as levels of sweetness, fat content chocolate and dairy boost flavours must be taken into consideration. This is to ensure the product has a pleasant taste with a drinkable smooth consistency.

### Methodology of Development for Breakfast Drink

*Table 5. Composition for breakfast beverage*

<b>Ingredients</b>	<b>Composition (%)</b>
Low-Fat Milk, 2%	47.25
OVAVO Avocado Powder	1.80
Calcium Caseinate	7.41
Cocoa Powder	1.02
Sucralose	1.51
λ-Carageenan	0.01
Microcrystalline Cellulose, MCC	0.13
Carboxymethylcellulose, CMC	0.13
Water	40.73

*Table 6. Recipe for Breakfast beverage*

1.	Measure out MCC, CMC and Carageenan in a 5mL container separately then dry blend them to ensure complete mixing
2.	Hydrate the stabiliser mix in 5mL of hot water at 95°C, to completely solubilise the mixture
3.	Weight out all the dry ingredients into a 1L plastic container and dry blend, using a spatula until well combined
4.	Mix dry and wet ingredients using a rubber spatula, ensuring the mixture is well incorporated
5.	Mix the product in Silverson High Shear Mixer at 6500RPM for 1.5 minutes, using the emulsor screen, while lightly shaking it to ensure full incorporation
6.	Transfer the mixture to a glass container and seal tightly
7.	Chill product at 4°C, before serving