

Spirulina pasta

Initial Brief

Tahi Spirulina is New Zealand's first spirulina farm and has recently started producing artisan spirulina in Himatangi. The company is marketing spirulina as a sustainable food with a reduced environmental footprint. They are currently looking to further develop a market for their product by investigating innovative uses for their premium spirulina product.

Specifications given:

The product must:

- be a premium product
- be consistent with the Tahi Spirulina brand values
- reflect current market trends relevant to superfoods
- have a Health Star rating which appeals to your target market
- have a shelf life beyond 9 months
- appeal to a vegetarian, and possibly vegan, consumers
- must consider the food safety risks and hazards that could affect the product

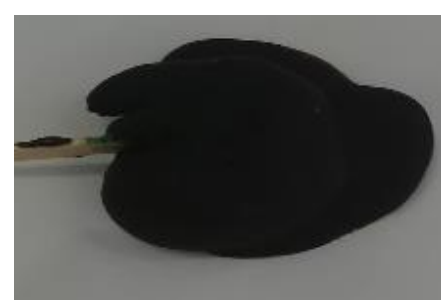
Research

- Spirulina holds vitamin A,B,C and E while also holding a lot of minerals like calcium, magnesium, zinc and selenium.
- A good source of iron for vegans giving 1.5mg per 5g of spirulina.
- A great source of protein content between 59-65%.
- Has a complete source of amino acid and omega-3.
- Main market of Spirulina is tablets or powder and is commonly used in smoothies .
- Prices can range from \$21.90 to \$40.60 per kilo depending on how much you buy and the quality of the spirulina
- Spirulina as a dietary supplement has the largest production of 5,000 tonnes and makes 40m annually
- Is known as a superfood.
- Is vegetarian and vegan friendly product.
- Is grown throughout the world e.g. Mexico, China, Thailand and more.

Concept Development Stages

Spirulina truffles

Our first idea was to make spirulina truffles with a chocolate coating to appeal to a wider market. Although the flavour was appealing we decided that the reduced of added sugar went against our brief



Spirulina waffles

We decided to try waffles to see how they'd go. We liked the idea of chicken and waffles. They didn't taste like anything really, except when we added maple syrup, so we had the same problem we had with the truffle - something that worked sweet but was not so healthy



Spirulina pasta

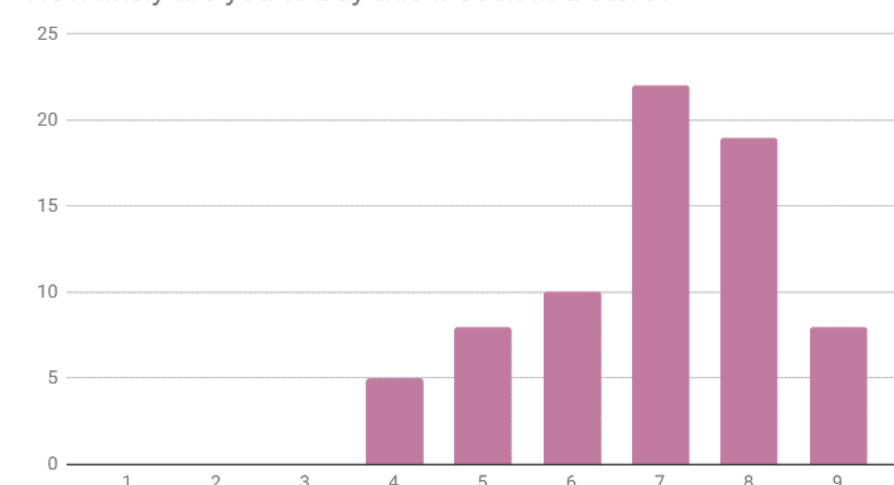
This idea sparked from us not wanting to make a spirulina smoothie or something that was too sweet. In doing so we came up with pasta, a more versatile option that has a considerably wider range of product uses.



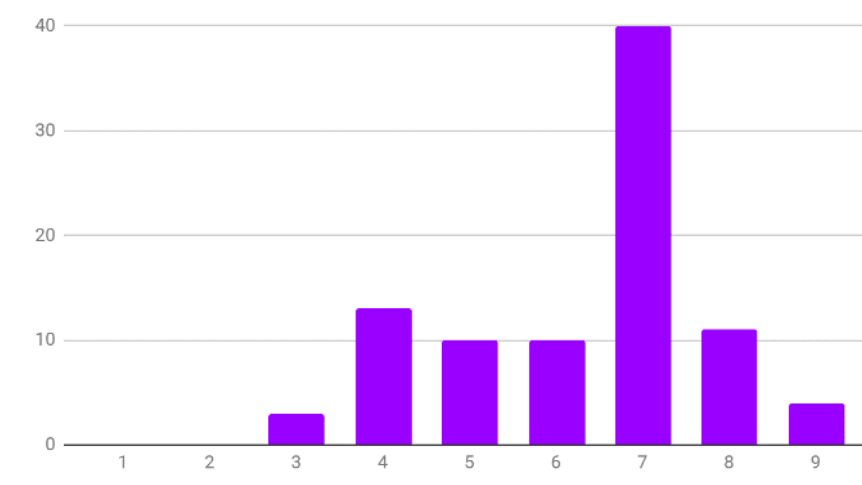
Sensory Testing

We tested the acceptability of our product at our schools open evening with prospective students and parent. Many of whom represent our target market.

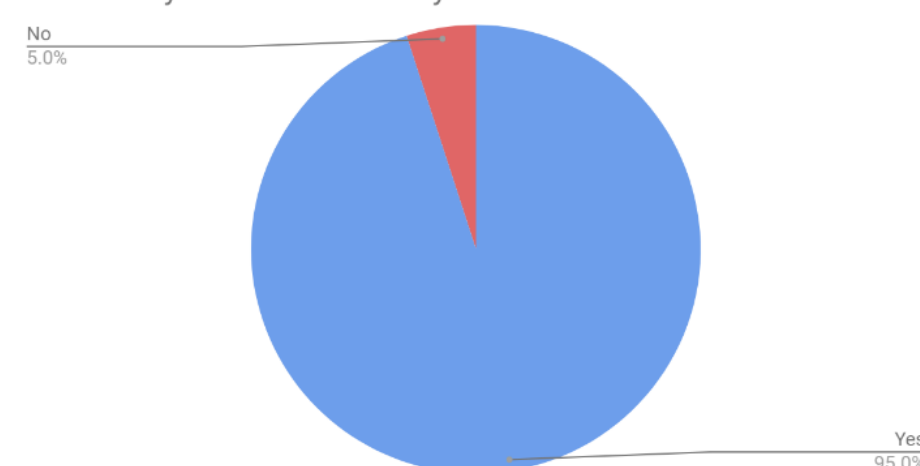
How likely are you to buy this if seen in a store?



How appealing/appetising does this look?



Would knowing that Tahi Spirulina is sustainably produced influence your decision to buy it?



Prototype development

Dried pasta

Our prototype to develop was dried pasta, to extend the product shelf life and to restrict water activity. At this stage we decided to remove egg to make our product vegan



Cooked spirulina pasta

Drying process

We trialled air drying and dehydrator and found an optimal drying temperature is 50 degrees on bake in the oven. We also tried drying the pasta at a higher temperature which were 75 and 120 degrees only to find out that it slowly started to cook the pasta .



Oven dried at 50 degrees °C

Fridge versus freezer

One of our big problems with our dough was how should we store our pasta dough before drying it. We just instinctively thought to put it into the freezer so it would freeze the water content making bacteria unable to grow, but in doing so we ruined the stability of the dough causing it to break apart while cooking it. So we thought of a way that we could stop this from happening was by putting it in the fridge, since it does the same as a freezer, stopping bacterial growth, and doesn't freeze the water content, meaning the dough won't lose its stability. Thus showing that the preferred way of storing our pasta is the fridge.

Extruder versus bench top pasta machine

We trialled both an extruder and bench top pasta machine and found that the bench top machine worked better at this stage and gave us a good idea of the texture required. Later we decided that the extruder worked best after all.



Bench top machine



Extruder

Packaging

Dried pasta

We trialled vacuum packaging and cardboard box and found the Vacuum pack was too fragile.



Change to fresh pasta

We had issues with the dried pasta breaking apart during cooking. Our stakeholder advice was to change to fresh pasta instead of dry as this is seen as a more premium product and where he could see it fitting in the market.

Packaging fresh pasta

Our fresh product would require that the pasta be pasteurised in conjunction with Modified Atmosphere Packaging. The labelling would need to align with Tahi Spirulina's brand as a companion product and to meet New Zealand packaging regulations.



Packaging mock up

Further development

- Investigation into and development of a range of pasta products, for example: ravioli or soba noodles.
- The potential incorporation of other ingredients with known health benefits such as pulse flour.
- Further trials of binding additives such as xanthium gum or guar gum to increase the physical stability of the pasta.
- A recipe card for Moore Wilsons as many customers prefer to make pasta themselves

Final Evaluation

Our product meets our brief by showcasing spirulina as a characterising ingredient. It is vegan friendly and should appeal to the health conscious and sustainably minded consumer. With the use of modified atmosphere packaging it would have an extended shelf life as a "fresh" product.



CREST



Thank you to these people:
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