

# PLENTY MORE FISH IN THE SEA

Recovery of fish flesh from blue cod frames for use in a commercially viable food product

Emily Wu  
emily.wu@lphs.school.nz  
Annie Kennedy Atchison  
kennedyatchisona@lphs.school.nz  
Heather Brown  
hab@lphs.school.nz

## Aim

We are aiming to replicate the same amount of fish flesh recovery as that of industry so that we can develop a product that uses recovered fish flesh off discarded frames. This may contribute towards heightened awareness of a valuable resource which is currently discarded.

## Hypothesis

The average percentage of fish flesh recovered from fish frames using domestic methods during students trials will be less than the average reported percentage of fish flesh recovered from fish frames using common commercial mechanical methods.

## Concepts

### Primary Products

- Fish jerky
- Fish mince incorporated into fresh pasta
- Fish sausage
- Pet food

### Secondary Products

- Bone fertilizer
- Fish stock



Our final decision to make fish sausages was arrived at with advice from our mentor Tanyaradzwa E Mungure.

## Background Research

Aspects of research covered included researching the existence of *fish sausages in the New Zealand market* (very few); *sausage casings* (thin caseins preferred); *nutritional value of blue cod* (low Omega -3 content); *anti-oxidants* (rosemary, lemon zest and smoking); *oxidation* (thin sausages need to be cooked from frozen).

Our research also showed that after the whole fish is commercially filleted, 50% of it is discarded either in landfills or dumped at sea. Mechanical deboners used by companies like Sealord can recover on average 30% of this wasted fish. Developing primary and secondary products resulting in zero waste could substantially reduce the amount of fish frames currently being dumped at sea or going into land fill.

## Trial Method

We completed two trials where we weighed each frame, and then reweighed after recovering high quality fish flesh by cutting and scraping with a chef's knife. In our second trial we successfully repeated the same method and then minced the recovered flesh. We then included it in two recipes with contrasting ingredients to make fish sausages.

## Main Variables

*Independent variable*—Method of flesh recovery

*Dependent variable*—Amount of fish flesh recovered

## Results

Both trials were successful.

In our first trial, we recovered an average of 30.4% of high quality flesh from the blue cod fish frames. Some variables that may have affected this result were removal techniques, time spent per frame and size of the frame.

In the second trial, we repeated the same method and recovered an average of 25% flesh. We divided the recovered flesh into two batches for use in two recipes with contrasting ingredients and successfully produced two different types of sausages.

## Nutritional Information



98% Blue Cod

Nutrition Information		
Servings per package:	5.00	
Serving size:	215.00 g	
	Average Quantity per Serving	Average Quantity per 100 g
Energy	1270 kJ	590 kJ
Protein	42.3 g	19.7 g
Fat, total	4.7 g	2.2 g
- saturated	3.2 g	1.5 g
Carbohydrate	0.7 g	0.3 g
- sugars	0.7 g	0.3 g
Sodium	547 mg	254 mg



66.8% Blue Cod, 28.4% Pork Fat

Nutrition Information		
Servings per package:	5.00	
Serving size:	369.00 g	
	Average Quantity per Serving	Average Quantity per 100 g
Energy	4260 kJ	1150 kJ
Protein	58.6 g	15.9 g
Fat, total	75.4 g	20.4 g
- saturated	28.8 g	7.8 g
Carbohydrate	2.3 g	0.6 g
- sugars	1.8 g	0.5 g
Sodium	1130 mg	305 mg

## Consumer Evaluation

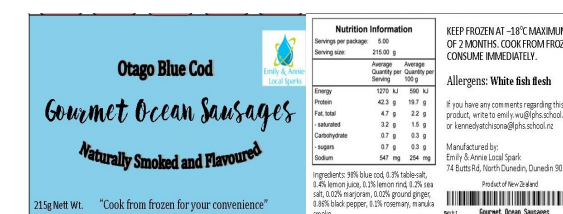
After sensory evaluation, we determined that the superior sausage was the one containing pork fat. This was because fat is a flavor enhancer, improves mouth feel and overall palatability. This was despite the other sausage having superior nutritional content.

## Conclusion

We can confidently state that our project had a successful outcome as we were able to recover the same levels of fish flesh as industry, and produced a high quality food product which is currently not available for domestic purchase.

## Packaging

Vacuum packed smoked fish sausages containing natural anti-oxidants to limit oxidation. Cook from frozen to maximize food safety.



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