High Protein Noodles Recipe

1. **Noodles formulation**
   Investigate the effect of incorporating Buntine Protein® on noodles quality attributes, different ratios (100g total solids ingredients, without GDL or salt) of wheat flour (WF) and Buntine Protein® (BP) was used as presented in Table 1.

Table 1 fortified noodles formulations

Formulation no.	Raw materials	Mixing ratio WF:BP	Water (g)	Salt content (g)	GDL (g)	Total protein g/100g DB
1	WF	100:0	40	2	1.49	10.5
2	WF: BP	85:15	40	2	2.93	20.63
3	WF: BP	75:25	40	2	3.87	27.38
4	WF: BP	65:35	40	2	4.84	34.12
5	WF: BP	55:45	40	2	5.8	40.88

GDL, glucono-delta lactone; BP, Buntine Protein; WF, wheat flour.

1.1 Noodles Preparation

To prepare noodles 10g of dry (flour plus BP) was used. The control samples were prepared from 100% wheat flour (formulations 1). The BP was used to replace the WF at 15%-45% Table1.

Noodles dough was prepared based on Udon noodle tradition process (unpublished).

The 100g of flour/protein concentrate was placed in a glass beaker and mixed using cake mixer.

The salt and GDL were dissolved in 40g of distilled water.

Then, the water was added to the dry ingredients and mixed for 1 minute by cake mixer to form noodle crumbs.

Then, the crumbs were kneaded for 4 minutes. Noodle dough was then covered with plastic wrap and kept for 30 minutes at room temperature to rest.

The dough was then hand knead for 2 minutes before sheeting using a pasta making machine Fimar (model SFS132025050M, Verucchio, Italy).

The sheeting was done firstly at position 3 for 3 times, then the noodle sheet was folded in half and sheeted for another 3 times.

This sheeting regime was repeated using position 2.5 for 3 times followed by position 1.5 for 6 times.

Then, the noodle dough sheet was cut using a pasta cutter into strands with 2.43 mm thickness, 3.7 mm width and 7.5 — 10 cm length.

1.2 Noodle optimal cooking time

Noodles optimal cooking time (OCT) was investigated based on Udon noodles making method (unpublished).

After noodles was made as described in section 2. In 500 mL glass beaker, 250 mL of deionised water was added and bring to boil.

Then, 15g of noodles were transferred. Stirrer was used to prevent noodle from sticking to each other and well distribution of heat. The beaker was covered with aluminium foil to reduce evaporation and maintain temperature.
The cooking time was examined by removing 3 noodles strands from the beaker every 1 minute and using 2 glass slides to squeeze the strands.
The noodles considered cooked when the centre core of the noodles become not visible (not solid white anymore).

1.3 Cooking loss

The loss in noodles during cooking was determine based on Udon noodles making method (unpublished).
The noodles were prepared as described in section 2. Then, fully cooked noodles (using their OCT in section 3).
The cooked noodles were collected using strainer and cooled down by rinsing the noodles in deionised water for 30s.
The cooking and rinsing water were combined and dried using air oven at 105°C to constant weight.
Noodles residue collected after drying process where weighted.
Cooking loss was calculated as a percentage of noodles residues to raw noodles weight.

Cooking loss %= ((W2–W1)/W3) x 100
Where: W1, is empty dry beaker weight, W2, beaker and noodles residues after drying and W3 is raw noodles weight before cooking.

2. Results

Fortified lupin noodles

Table 2 Fortified lupin noodles cooking time and cooking loss

Formulation no.	Raw materials	Mixing ratio WF:BP	Cooking time min	Cooking loss (%)
1	WF	100:0	12	6.10
2	WF: BP	85:15	12	6.00
3	WF: BP	75:25	12	7.03
4	WF: BP	65:35	14	8.77
5	WF: BP	55:45	14	7.16

WF: Wheat flour, BP: Buntine protein®

Table 3 Cooked fortified noodles sensory evaluation colour, flavour and texture

Formulation no.	Raw materials	Colour 1–10	Flavour (beany) 1–10	Texture 1–10
1	WF			
2	WF: BP			
3	WF: BP			
4	WF: BP			
5	WF: BP			

WF: Wheat flour, BP: Buntine Protein®

Figure 1 control and fortified noodles (cooked) at different mixing ratios