Instant Noodles Formulated with Yellow Pea Flour

Yellow Pea Flour in Instant Noodles

The addition of yellow pea flour in instant noodle formulations can improve nutritional properties of the final product by increasing protein and dietary fibre contents and providing essential vitamins and minerals. To successfully incorporate yellow pea flour into noodle formulations, the flour must be a fine particle size such as from the production of roller milling. However, variables other than flour particle size will also affect noodle quality. The inclusion of yellow pea flour in noodle formulations causes changes to the machinability of the dough and to the sensory properties of the final product, when compared to a 100% wheat flour formulation. Therefore, determining the modifications necessary for successful application of yellow pea flour in instant noodles is critical to achieving high end- product quality.

Noodle Formulation and Processing

Instant noodles were made following a standard commercial method for instant noodle production using the formulation provided in Table 1. Yellow pea flour was roller milled and included at levels of 5 and 15% with wheat flour in the noodle formulation.

A salt water solution was made by dissolving the salt in water prior to mixing. The wheat/yellow pea flour blend was mixed for 10 min at 100 rpm in a vertical noodle mixer with the salt water solution. After mixing, the dough crumbs were sheeted. The dough sheet underwent four initial sheeting stages where the gap width was reduced between stages to produce a thinner dough sheet after each pass. After the fourth pass, the dough sheet was allowed to rest for 10 minutes and then subjected to three more reduction passes prior to cutting. Depending on the processing method, the noodles were then cooked either by steaming with water or deep frying with oil. After cooking, the noodles were allowed to dry. Deep fried noodles were dried in a cooling tunnel equipped with fans, and steamed noodles were dried by hot air (85°C) for 30 min.

Table 1. Formulation for Instant Noodles Containing 5% and 15% Yellow Pea Flour Ingredient

Ingredient	Amount (%) of Ingredient in Noodle Formulation[1]	
	5 % Yellow Pea Flour	15% Yellow Pea Flour
Wheat flour, 13.9% protein[2]	95	85
Yellow pea flour, 26.4% protein	5	15
Water	32	32
Salt	1	1

[1]Percentage based on total flour weight
[2]dwb

Table 2. Quality of Deep Fried or Steamed Instant Noodles Containing 5 or 15% Yellow Pea Flour

Yellow Pea flour Inclusion Level	Deep Fried Noodles				Steamed Noodles			
	L*	a*	b*	Elasticity Index	L*	a*	b*	Elasticity Index
5%	75.14	1.87	20.05	175.5	68.72	3.50	20.09	276.3
15%	72.67	3.12	23.07	136.6	66.81	4.46	23.82	236.7

L* = brightness; a* = redness; b* = yellowness

Results and Recommendations

During noodle processing, the amount of water added to the formulation had major effects on dough crumb quality, dough sheet stickiness, and ease of machinability. Inadequate hydration resulted in streaky, dry dough sheets that could not withstand processing while over-hydration resulted in sticky dough sheets that could not pass through the mechanical rolls during processing. Adequate and appropriate water addition is therefore crucial for successfully incorporating pulse flours into instant noodle formulations.

Both the colour and elasticity of the noodles were changed as yellow pea flour inclusion increased in the noodle formulation. A 15% inclusion of yellow pea flour led to the production of noodles that were less bright, and slightly more red and yellow than those with 5% yellow pea flour. These differences in colour occurred regardless of noodle processing method. However, steamed noodles were less bright, redder, and slightly more yellow than deep fried noodles. On the other hand, steamed noodles exhibited greater elasticity compared to deep fried noodles, and in both noodles it was observed that elasticity decreased as the inclusion of yellow pea flour increased.

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