



# Product Profile

Pulse Flour Milling and Utilization Project | Cigi (Canadian International Grains Institute) | [cigi.ca](http://cigi.ca)



**Cookies Formulated  
with Yellow Pea Flour**

## Yellow Pea Flour in Cookies

Cookies are a popular food product in North America that are commonly made with grains such as wheat or oats. The inclusion of yellow pea flour in combination with these grains can greatly enhance the nutritional profile by increasing fibre, protein and mineral content of the blended flour. Different milling methods have been shown to affect functional and physical characteristics of the resulting yellow pea flour which in turn can affect cookie quality. Therefore, careful consideration should be given to yellow pea flour specifications to avoid compromising end product quality.

### Cookie Formulation and Processing

Cookies containing 30% yellow pea flour were produced using a standardized method using the formulation provided in Table 1. The flour blend was made using a commercially available soft wheat flour.

Sugar, salt, sodium bicarbonate and non-fat dry milk powder were mixed and added to shortening to form creamed mass. A solution of high fructose corn syrup and water were mixed and then added to ammonium bicarbonate. This solution was added to the creamed mass and mixed for 1 minute in a lab scale KitchenAid mixer. The blended yellow pea/wheat flour was added and mixed for a total of 2 minutes, scraping down the mixing bowl every 30 seconds. Dough was equally divided, rounded by hand, and placed on a greased cookie sheet where it was rolled into cookies with a 7 mm thickness and then cut using a 60 mm cookie cutter. Cookies were then baked for 8 minutes at 375°F.

**Table 1. Formulation for Cookies Containing 30% Yellow Pea Flour**

Ingredient	Quantity (g)
Sugar	94.5
Salt	2.8
Sodium bicarbonate	2.3
Skim milk powder	2.3
Shortening	90
High fructose corn syrup	3.4
Ammonium bicarbonate	1.1
Wheat/Yellow pea flour (14% mb)	225
Water <sup>1</sup>	Variable

<sup>1</sup> Water addition based on flour moisture content

**Table 2. Physical and Functional Specifications of Whole and Split Yellow Pea Flours and Corresponding Cookie Quality**

Pea Flour Production Method	Whole/Split Flour Properties			Whole/Split Yellow Pea Cookie Properties	
	Average Particle Size (µm)	Water Absorption Capacity (g/g)	Total Dietary Fibre Content (%)	Thickness (mm)	Force to break (kg)
Soft wheat flour	76.3	0.61	ND <sup>1</sup>	9.2	2.06
Stone	595.6/329.5	1.88/1.12	17.8/14.6	8.52/7.63	1.84/1.64
Pin – Coarse	276.8/130.0	1.34/1.04	15.3/7.9	9.54/9.01	2.71/1.95
Pin – Fine	97.1/44.0	1.31/1.04	15.3/7.3	9.98/9.66	3.09/2.85
Roller	236.8/62.3	1.41/1.35	16.0/7.0	10.00/9.66	3.06/2.57
Hammer	274.2/175.5	1.57/1.11	21.8/12.0	8.95/8.06	2.22/1.57

<sup>1</sup> No data available for wheat flour.

## Results and Recommendations

Differences were observed among cookies made with split and whole flours as well as among the different milling methods (Table 2). These differences are likely due to the differences in particle size distribution among the yellow pea flours as well as the increased fibre levels. Stone and hammer milled flours had larger particles and produced cookies that were wider with reduced thickness, a greater overall spread and required less force to break implying that these flours may be suitable in producing a crisp cookie. Roller and pin milled flours, which had a smaller particle size produced cookies that were thinner with reduced widths and spreads and required more force to break suggesting they may be suitable for a softer textured cookie that does not snap or break as easily.

Whole flours which had an increased water absorption capacity, were better suited for thicker cookies that did not break or snap easily compared to split flours milled using the same milling method. Yellow pea flours were successfully added to cookie formulations and contributed to a nutty final flavour and aroma. Consideration should be given to yellow pea flour properties in order to produce a cookie that meets the desired quality parameters.



**Cookies Formulated with 30% Split Yellow Pea Flour Produced Using Different Milling Methods**

L-R: 100% Wheat Control, Stone, Pin – Coarse, Pin – Fine, Roller, Hammer

## CONTACT US

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## Project Partners and Funders

