

# Corn Protein in Breakfast Biscuit



Protein ingredients can be added to bakery and snack products to aid in water and fat retention. Another benefit is protein fortification. An experiment was run to evaluate the impact of adding corn protein to a breakfast biscuit formula. The example compared a base pea-rice protein-supplemented and corn-pea protein-supplemented formula.

Corn protein was produced by Cargill with at least 85 wt% corn protein (dry basis) and less than about 1.5 wt% oil (dry basis), as described in patent application WO20161544CPI. The formula could be adapted to use corn protein with a minimum of 65 wt% protein and less than 3 wt% oil (dry basis) and anticipate the same finding.

Breakfast biscuits with and without the addition of corn protein were prepared using the formula and process procedures listed.

## FORMULA

Ingredients	Base (%)	Supplemented (%)
Pea Protein	7.80	5.40
Soy Flour	1.50	1.50
Corn Protein	0.00	5.40
Rice Protein	3.00	0.00
Pro Grain & Seed Blend IV	10.00	10.00
Cinnamon	0.75	0.75
Sugar	13.00	13.00
Salt	0.60	0.60
Bourbon Vanilla Flavor	0.50	0.50
Water	15.63	15.63
Malt Syrup	3.50	3.50
Soybean Oil	11.50	11.50
Lecithin	1.00	1.00
Baby Oat Flakes	15.00	15.00
Ultragrain Wheat Flour	15.00	15.00
Vital Wheat Gluten	1.00	1.00
Sodium Bicarbonate	0.11	0.11
Sodium Aluminum Phosphate	0.11	0.11
<b>Total</b>	<b>100.00</b>	<b>100.00</b>

## PROCESSING PROCEDURE

1. Combine pea protein, rice protein, soy flour, corn protein (when indicated), Pro grain & seed blend, cinnamon, salt, vanilla, water and malt syrup in a Hobart mixer, mix for 2 min on low
2. Add soybean oil and lecithin, mix 1 min on low (speed 1) and mix 1 min on medium (speed 2)
3. In a separate bowl, blend baby oat flakes, Ultragrain flour, vital wheat gluten, sodium bicarbonate, and sodium aluminum phosphate. Add this blend to the other ingredients and mix 1 minute on low (speed 1)
4. Scrape down and mix 1 minute on low (speed 1)
5. Place dough into rotary molder and create biscuits
6. Bake at 320°F for 24 minutes (reel oven)
7. Remove from baking sheet when cool
8. Pack when cool in moisture-barrier packaging

## RESULTS

The treated and untreated samples were comparable in both processing and final appearance. The height, moisture and Aw of the untreated and treated samples were also similar.

	Height (mm)	Moisture (%)	Aw
<b>Untreated</b>	63	6.35	0.44
<b>Treated</b>	61	6.45	0.44



*Control breakfast biscuit (left) and test breakfast biscuit with corn protein (right).*

## CONCLUSION

Corn protein can be used in a formula to create a breakfast biscuit comparable to control without added proteins.