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Acrylamide Reduction - White Round Tortilla Chips:

- a. Objective – Plant trial pHase® (bisulfate of soda) addition in a white tortilla chip to reduce acrylamide.
- b. General Procedure – A 40% solution of pHase® was add to the corn at the grinder by a dosing pump to achieve a 0.5% addition rate (Test 1) and 0.75% addition rate (Test 2) to the masa. The pH was reduced to 5.2 and 4.7 respectively.

Wyandot Product Code 349 White Round Tortilla Processing Parameters with 0.5% & 0.75% pHase® Addition

<i>Time</i>	<i>pH Masa</i>	<i>pHase Pump Setting</i>	<i>Comments</i>
CONTROL			
9:30*	6.9-7.0	0	
Test 1			
9:40	5.2 (hog)	57.4 rpms	106 ml/min (14 lb/hour)
9:45	5.0-5.1 (hog)	57.4 rpms	106 ml/min (14 lb/hour)
9:50*	5.3 (sheeter)	57.4 rpms	106 ml/min (14 lb/hour)
Test 2			
10:30	4.6-4.7 (hog)	84.8 rpms	156 ml/min (20.6 lb/hour)
10:37	4.9-5.2 (sheeter)	84.8 rpms	156 ml/min (20.6 lb/hour)
10:42	-----	89.9 rpms	166 ml/min (21.9 lb/hour)
11:50	4.6-4.7 (hog)	89.9 rpms	166 ml/min (21.9 lb/hour)
11:51*	4.7-4.8 (sheeter)	89.9 rpms	166 ml/min (21.9 lb/hour)

*Pull product for acrylamide analysis.

Analysis of pHase® Addition White Corn Tortilla Chips 11/16/10

Test no.#	pH	Acrylamide (ppb)*	% Moisture Content**	% Oil***	Density (wt. per 10 chips) grams	% Salt^
Control	6.9-7.0	514	1.0	22.5	26.1	1.1
Test 1	5.3	195	1.0	24.0	25.9	0.9
Test 2	4.7-4.8	70				

*Covance Laboratories – Greenfield ACMS_GRN_S:3

**Mettler Moisture on unsalted chip base

***Carver Press on unsalted chip base

^Mettler Autotitrator

Results – A 63% reduction of acrylamide was achieved at 0.5% addition rate of pHase®, and 87% reduction at 0.75% addition rate of pHase®. The chips were sent for sensory evaluation at the Ohio State University. The 0.5% addition rate (Test 1) was judged as no significant difference from the control. The 0.75% addition rate (Test 2) was judged slightly different from control.

OSU Sensory Results on pHase® Addition White Round Tortilla Chips

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Liking Results

ATTRIBUTE 9 Point Hedonic	P Value	Test 1	Control	Test 2	Significance
Visual Appearance Liking	0.1311	6.94 a	6.68 a	6.75 a	NS
Overall Liking	0.0014	6.89 a	6.88 a	6.28 b	SIG
Liking of the Corn Flavor	0.0001	6.64 a	6.70 a	5.87 b	SIG
Liking of the Color	1.6945	6.71 a	6.60 a	6.60 a	NS
Liking of the Texture	0.0036	7.03 a	7.12 a	6.53 b	SIG

(The letter 'a' denotes similarity; b denotes a significant difference at the 95% confidence level)

Liking Results - Continued

ATTRIBUTE 5 Point Hedonic	P Value	Test 1	Control	Test 2	Significance
Amount of After Taste (if any)	0.0006	2.50 a	2.50 a	2.87 b	SIG
Purchase Intent of the Chips	0.0001	3.48 a	3.47 a	2.93 b	SIG

(The letter 'a' denotes similarity; b denotes a significant difference at the 95% confidence level)