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ISO 9001-2008 | ISO 9001-2015 | EMS 14001 | OHSAS 18001 In Association with SVCH-Technologii, Moscow (Russia)

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Customer :	Laboratory Experimental Analysis
Process :	Batch Convection Heat Treatment for Drying of Potato Peel and Smash

TEST REPORT No: 47/KRDC/LAB/17 Mum 04/12/2018

Date Sample reception	: 04/12/2018
ID	: 47/LAB/73

SAMPLE DESCRIPTION:

Sampling	: As Requested
Sample Condition	: Acceptable
Quantity	: 2 packets
Sampling date	: 01/01/2019
Product	: Potato Peel and Smash
Requirement	: Final product must have moisture content less than 10%
Start Date test	: 01/01/2019
End Date test	: 03/01/2019

LABORATORY EXPERIMENTAL SET UP:







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LAB BATCH CONVECTION HEATING SYSTEM SPECIFICATIONS:

Heating Zone (width*height*depth)	510*480*410 mm
No. of Heaters	6
Total Heater Power	6 kW
Motor	0.5 HP
Centrifugal Exhaust Blower	1440 rpm
Vacuum Blower	0.85kW
No. of trays	6
Tray size	560*25*435 mm
(width*height*depth)	

ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

Temperature (degree C)	28.5°C (±5°C)
Humidity (%)	≤64% RH
Pressure (kN/m2 or kPa)	Not recorded

Note for recommendation: Environmental conditions have a direct impact on test results. Accuracy and consistency of test data are affected by the laboratory conditions

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EQUIPMENTS USED:

Name of Equipment	Picture of Equipment	Specifications
Compact Thermal Imaging Camera		Model: FLIR E-30 Resolution: 160x 120 IR Thermal sensitivity of 0.10°C
Moisture Analyzer		Make: Axis Balance Description: Moisture range: 1%(sample 0.02/0.05g), 0.1% (Sample 0.5/5g), 0.01%(Sample>5g)
Thermo Hygrometer		Model No: HTC-2 Temperature accuracy: ±°C (1.8°F) Temperature resolution: 0.1°C (0.2°F) Humidity range: 10%~99% RH Humidity accuracy: ±5% RH Humidity resolution: 1% RH

SAMPLE PREPARATION AND METHOD/PROCEDURE:

The experiment has been performed on potato peel and potato smash without adding any additive to speed up the drying rate. For this experimental run, the given sample of potato peel has been placed on perforated dehydrator tray, while potato smash has been placed on non-perforated tray and the loaded tray placed in heating system with suitable setting parameters. The observations are made on LOD basis. Also, initial weight before drying, final weight after drying, initial moisture content, final moisture content after heat treatment has been noted.

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ANALYTICAL RESULTS:

1. POTATO PEEL:

Setting Temperature: 70°C Initial Moisture Content: 86.4% Initial Weight: 400 grams

Sr.	Time	Weight noted	Total weight	Temperature on	Remarks, if any
No.	(minutes)	(grams)	loss (%)	sample(°C)	
1.	After 30	200	50	58.7	Drying rate started
2.	After 60	134	66.5	61.9	Drying phase continue
3.	After 90	98	75.5	67.4	Variant of Drying rate
4.	After 120	55	86.25	70.2	Required Drying rate

Sample weight after drying: 55 grams Total weight loss on drying: 86.25% Final Moisture Content: 2%

2. POTATO SMASH:

Setting Temperature: 70°C for 1 hour and then 80°C Initial Moisture Content: 73.2% Initial Weight: 800 grams

Sr.	Time	Weight noted	Total weight	Temperature on	Remarks, if any
No.	(hours)	(grams)	loss (%)	sample(°C)	
1.	After 1	679	15.12	55.7	Drying rate started
2.	After 2	457	42.87	60.2	Drying phase continue
3.	After 3	244	69.5	67.9	Variant of Drying rate
4.	After 4	216	73	75.3	Variant of Drying rate
5.	After 5	196	75.5	79.9	Required Drying rate

Sample weight after drying: 196 grams

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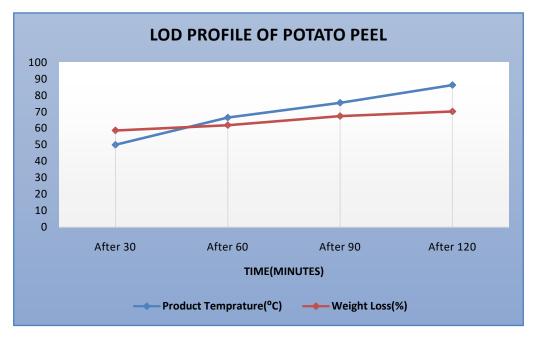
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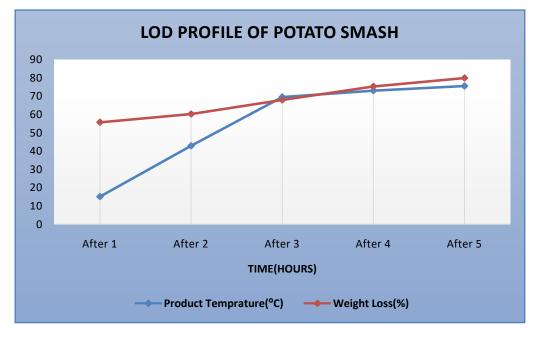
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Total weight loss on drying: 75.5% Final Moisture Content: 2.7%

GRAPHICAL REPRESENTATION OF DRYING PARAMETERS:





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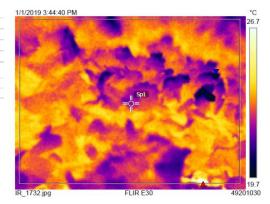
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THERMAL IMAGE BEFORE AND AFTER HEAT TREATMENT:

1. POTATO PEEL:

Before Heat Treatment:

Bx1	Max	27.4 °C
	Min	19.2 °C
	Average	22.9 °C
Sp1		22.1 °C
Param	eters	
Emissivit	iy .	0.95
Refl. tem	ID.	20 °C



After Heat Treatment:

Measure	ments		1/1/2019 5:42:58 PM	
Bx1	Max	71.6°C		٦
	Min	52.8°C	100 100 100 House 100 100 100 100	
	Average	62.2°C		
Sp1		70.2°C	THE REAL PROPERTY AND ADDRESS OF	
Paramet	ers			
Emissivity		0.95	land she on her and the second s	
Refl. temp.		20 °C	Sol	
			and the second	1
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2. POTATO SMASH:

1/2/2019 11:58:18 AM Measurements **Before Heat Treatment:** 24.0 Bx1 Max 22.7 °C Min 21.3 °C Average 22.1 °C Sp1 21.9 °C Parameters Emissivity 0.95 Refl. temp. 20 °C 20.0

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The value obtained is already corrected for possible recover value stated, if applicable. This document may not be reproduced or disclosed wholly or partly in any part thereof without the written consent of the laboratory management or customer. This document relates only to the specimen samples processed. The processed sample will be kept in this laboratory for 7 days from the date of heat treatment.

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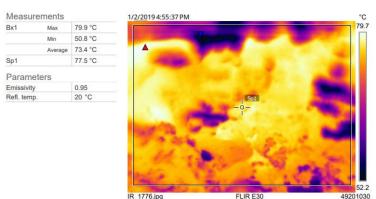


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After Heat Treatment:



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BEFORE AND AFTER PICTURES OF TREATED SPCIMEN SAMPLE:

1. POTATO PEEL:





2. POTATO SMASH:





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MOISTURE ANALYSIS REPORTS:

Drying started	? Drying started
Date : 1-01-2019	Date : 2-01-2019
Time :16:24:28	Time :11:05:28
Model:AG5200 Serial number : 138	Model:AGS200
	Serial number : 138
Brying parameters	Drying parameters
Product : Test	Product : Test
Drying temperature : 105.0 °C	Drying temperature : 105.0 °C
Drying profile : standard	Drying profile : standard
Mode : Short mode Calculation : ((mO-m)/mO)#100%	Mode : Short wode
Finished : 3 samples	Mode : Short wode Calculation : ((w0-m)/w0)#100% Finished : 3 samples
Initial weight : 1.290 g	Initial weight : 0.221 g
Final weight : 0.176 g	Final weight : 0.217 g
Drying time : 00:29:00s	Drying time : 00:01:40s
Sampling interval : 20 sec	Sampling interval : 20 sec
Moisture : 86.4 %	Moisture : 2 %
NOTE Initial (Potato Peel)	NOTE Final (Potato Peel)
indiad (londo rea)	ind forde reed
The analysis performed by:	The analysis performed by:
INAV	11 07014
KKomat	KROIN
Signature, KKomat	Signature. KKomaL
Signature, KKomar	Signature
Sinnatura	Signature
Sinnatura	S1gnature
2° Drying started Date : 3-01-2019	? Drying started
2° Drying started Date : 3-01-2019 Time :14:30:42	Prying started Drying started
2° Drying started Date : 3-01-2019 Time :14:30:42 Model:485200	Prying started Pate : 3-01-2019 Time : 12:05:43 Model: A05200
2* Drying started Date : 3-01-2019 Time :14:30:42 Model:465200 Serial number : 138	Prying started Drying started Date : 3-01-2019 Time :12:05:43
2° Drying started Date : 3-01-2019 Time :14:30:42 Model:A6S200 Serial number : 138 Drying parameters	Prying started Pate : 3-01-2019 Time : 12:05:43 Model: A05200
?* Drying started Date : 3-01-2019 Time :14:130:42 Model:A6S200 Serial number : 138 Drying parameters Product ; Test	Prying started Date : 3-01-2019 Time :12:05:43 Model:A65200 Serial number : 138
2° Drying started Date : 3-01-2019 Time :14:30:42 Model:A6S200 Serial number : 138 Drying parameters	2 Drying started Date : 3-01-2019 Tame : 12:05:43 Model:405200 Serial.number : 138 Drying parameters
2* Drying started Date : 3-01-2019 Time :14:30:42 Model:A65200 Serial number : 138 Drying parameters Product : Test Drying temperature : 105.0 *C Drying profile : standard	Prying started Date : 3-01-2019 Time : 12:05:43 Model:A65200 Serial number : 138 Drying parameters Product : Test Drying temperature : 105.0 °C
2* Drying started Date : 3-01-2019 Time :14:30:42 Model:A65200 Serial number : 138 Drying parameters Product : Test Drying temperature : 105.0 *C Drying profile : standard	Prying started Pate : 3-01-2019 Time : 12:05:43 Model:A05200 Serial number : 138 Drying parameters Product : Test Drying temperature : 105.0 °C Drying profile : standard
2* Drying started Date : 3-01-2019 Time :14:30:42 Model:A65200 Serial number : 138 Drying parameters Product : Test Drying temperature : 105.0 *C Drying profile : standard	Prying started Pate : 3-01-2019 Time : 12:05:43 Model:A05200 Serial number : 138 Drying parameters Product : Test Drying temperature : 105.0 °C Drying profile : standard
2* Drying started Date : 3-01-2019 Time :14:30:42 Model:A65200 Serial number : 138 Drying parameters Product : Test Drying temperature : 105.0 *C Drying profile : standard	Prying started Date : 3-01-2019 Time : 12:05:43 Model:A68200 Serial number : 138 Drying parameters Product : Test Product : Test Drying temperature : 105.0 °C Drying profile : standard Mode : Short wode Calculation : ((m0-m)/m0)\$1002 Finished : 3 samples
?* Drying started Date : 3-01-2019 Time :14:30:42 Model:A8S200 Serial number : 138 Drying parameters Product : Test Drying temperature : 105.0 *C Drying profile : standard Model: Short mode Calculation : ((mD-m)/wD)#100X Finished : 3 samples	Prying started Date : 3-01-2019 Time : 12:05:43 Model: AGS200 Serial number : 138 Drying parameters Product : Test Drying profile : standard Mode : Short wode Calculation : ((w0-w)/w0)#10002 Finished : 3 samples Initial weight : 1.184 g
12gnature, ?* Drying started Date::3-01-2019 Time::14:30:42 Model:A65200 Serial number: 138 Drying parameters Product : Test Drying temperature : 105.0 °C Drying profile : standard Mode : Short mode Calculation : ((=0^-s)/w0]*100X Finished : 3 samples Initial weight : 0::59:405	Prying started Date : 3-01-2019 Time : 12:05:43 Model:A65200 Serial number : 138 Drying parameters Product : Test Drying temperature : 105.0 °C Drying temperature : : Short wode Calculation : ((u0-w)/w0)#1002 Finished : 3 samples Initial weight : 1.184 g Final weight : 1.152 g
2* Drying started Date::3-01-2019 Time::14:30:42 Model:A6S200 Serial number:: 138 Drying parameters Product:: Test Drying temperature:: 105.0 *C Drying profile: : Short mode Calculation: : ((m0-m)/m0)#100X Finished: : 3 samples Initial weight: 0.371 g Drying time: 00:59:40s Sampling interval:: 20 sec	Prying started Date : 3-01-2019 Time : 12:05:43 Model: AGS200 Serial number : 138 Drying parameters Product : Test Drying profile : standard Mode : Short wode Calculation : ((w0-w)/w0)#10002 Finished : 3 samples Initial weight : 1.184 g
2* Drying started Date::3-01-2019 Time:14:30:42 Model:A8S200 Serial number: 138 Drying parameters Product: : Test Drying temperature: 105.0 *C Drying profile: : standard Model:A8S200 : Short mode Calculation: : ((m0-m)/m0)x1000 Finished: : 3 samples Initial weight: 0.440 g Final weight: : 00:59:40s Sampling interval: : 20 sec Moisture: : 73.2 %	Prying started Pate : 3-01-2019 Tise : 12:05:43 Model:A05200 Serial number : 138 Drying parameters Product : Test Drying pofile : standard Node : Short wode Calculation : ((u0-w)/00)\$1002 Finished : 3 samples Initial weight : 1.184 g Final weight : 1.152 g Drying time : 00:06:40s
2* Drying started Date::3-01-2019 Time:14:30:42 Model:A8S200 Serial number: 138 Drying parameters Product: : Test Drying temperature: 105.0 *C Drying profile: : standard Model:A8S200 : Short mode Calculation: : ((m0-m)/m0)x1000 Finished: : 3 samples Initial weight: 0.440 g Final weight: : 00:59:40s Sampling interval: : 20 sec Moisture: : 73.2 %	Prying started Date : 3-01-2019 Time : 12:05:43 Model: 405200 Serial number : 138 Drying parameters Product : Test Drying porfile : standard Mode : Short wode Calculation : ((u0-m)/40)*1002 Finished : 3 samples Initial weight : 1.184 g Final weight : 1.152 g Drying time : 00:06:40s Sampling interval : 20 sec Moisture : 2.7 %
?* Drying started Date: 3-01-2019 Time: 14:30:42 Model:A85200 Serial number: 138 Drying parameters Product : Test Drying temperature: 105.0 °C Drying profile : standard Mode: : Short mode Calculation : (100-m)/m0)#1000 Finished : 3 samples Initial weight : 0.371 9 Drying time : 00:57:40s Sampling interval : 20 sec	Prying started Date : 3-01-2019 Time : 12:05:43 Model: 405200 Serial number : 138 Drying parameters Product : Test Drying porfile : standard Mode : Short wode Calculation : ((u0-m)/40)*1002 Finished : 3 samples Initial weight : 1.184 g Final weight : 1.152 g Drying time : 00:06:40s Sampling interval : 20 sec Moisture : 2.7 %
ignature, Prying started Date : 3-01-2019 Time :14:30:42 Model:AdS200 Serial number : 138 Drying parameters Product : Test Drying temperature : 105.0 °C Drying profile : standard Mode : Short mode Calculation : ((=0-=)/w0)¥100X Finished : 3 samples Initial weight : 0.460 g Final weight : 0.391 g Drying time : 00:59:40s Sampling interval : 20 sec Moisture : 73.2 Z	Prying started Date: 3-01-2019 Taxe: 12:05:43 Model:405200 Serial number: 138 Drying parameters Product : Test Drying temperature : 105.0 °C Drying temperature : 105.0 °C Drying temperature : 105.0 °C Drying temperature : 105.0 °C Drying temperature : 105.0 °C Initial weight : 1.152 9 Final weight : 1.152 9 Drying tame : 005:05:405 Sampling interval : 20 sec
And the second secon	Prying started Date : 3-01-2019 Time : 12:05:43 Model: 405200 Serial number : 138 Drying parameters Product : Test Drying porfile : standard Mode : Short wode Calculation : ((u0-m)/40)#1002 Finished : 3 samples Initial weight : 1.184 g Final weight : 1.152 g Drying time : 00:06:40s Sampling interval : 20 sec Moisture : 2.7 %
<pre>Prying started Pate :: 3-01-2019 Time :14:30:42 Model:AdS200 Serial number : 138 Prying parameters Product :: Test Drying temperature : 105.0 *C Prying temperature : 105.0 *C Prying profile :: standard Mode :: Short mode Calculation :: ((m0-m)/m0)×1000 Finished :: 3 samples Initial weight : 1.440 g Final weight : 0.391 g Prying time : 00:59:40s Sampling interval : 20 sec Moisture : 73.2 Z MOTE Mithal Cotato Smash NOTE Mithal Cotato Smash The analysis performed by:</pre>	Prying started Date: 3-01-2019 Tas: 12:05:43 Model:A68200 Serial number: 138 Drying parameters Product : Test Product : Test Drying temperature : 105.0 °C Drying profile : standard Mode Short wode Calculation : ((=0-=)/~0)3100X Finished : 3 samples Initial weight : 1.184 g Final weight : 1.152 g Drying time : 00:06:40S Sampling interval : 20 sec Moisture : 2.7 % NOTE Final (Polato Smash)
<pre>Prying started Pate :: 3-01-2019 Time :14:30:42 Model:AdS200 Serial number : 138 Prying parameters Product :: Test Drying temperature : 105.0 *C Prying temperature : 105.0 *C Prying profile :: standard Mode :: Short mode Calculation :: ((m0-m)/m0)×1000 Finished :: 3 samples Initial weight : 1.440 g Final weight : 0.391 g Prying time : 00:59:40s Sampling interval : 20 sec Moisture : 73.2 Z MOTE Mithal Cotato Smash NOTE Mithal Cotato Smash The analysis performed by:</pre>	Prying started Date: 3-01-2019 Tas: 12:05:43 Model:A68200 Serial number: 138 Drying parameters Product : Test Product : Test Drying temperature : 105.0 °C Drying profile : standard Mode Short wode Calculation : ((=0-=)/~0)3100X Finished : 3 samples Initial weight : 1.184 g Final weight : 1.152 g Drying time : 00:06:40S Sampling interval : 20 sec Moisture : 2.7 % NOTE Final (Polato Smash)
And the second secon	Prying started Date: 3-01-2019 Tas: 12:05:43 Model:A68200 Serial number: 138 Drying parameters Product : Test Product : Test Drying temperature : 105.0 °C Drying profile : standard Mode Short wode Calculation : ((=0-=)/~0)3100X Finished : 3 samples Initial weight : 1.184 g Final weight : 1.152 g Drying time : 00:06:40S Sampling interval : 20 sec Moisture : 2.7 % NOTE Final (Polato Smash)
2° Drying started Date :: 3-01-2019 Time :: 14:30:42 Model:A85200 Serial number : 138 Drying parameters Product :: Test Drying temperature : 105.0 °C Drying profile :: standard Model : Short mode Calculation :: ((m0-m)/m0)×1000 Finished :: 3 samples Initial weight : 0.450 g Final weight : 0.391 g Brying time : 00:59:40s Sampling interval : 20 sec Moite : 73.2 Z MOTE Millial Cotato Smash	Prying started Prying started Parts: 3-01-2019 Tax: 1:205:43 Model: 405200 Serial number : 138 Drying parameters Product : Test Drying temperature : 105.0 °C Drying temperature : : 105.0 °C Drying temperature : : 105.0 °C Drying temperature : : 105.0 °C Drying temperature : : 105.0 °C Drying temperature : : 105.0 °C Drying temperature : : 105.0 °C Drying temperature : : 05.0 °C Drying temperature : : 05.0 °C Drying temperature : : 00:00.000 Finished : : 1.052 °G Initial weight : : 1.152 °G Drying time : : 00:006:400s Sampling interval : : 20 sec Mote Circle Concal (Colcuto Smash)

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OBSERVATIONS:

The drying behavior of potato peel and smash has been investigated under the batch convection heating system. The drying rate is found to be increasing with respect to increasing drying time. It has been found that the moisture content on the dry basis (%) decreases with respect to increase in drying time. As per physical investigation, it has been observed that there is crunchiness in texture without change in colour and without burning in case of potato peel. But, in case of potato smash there is crunchiness with little colour change.

Komal

Miss Komal Bhoite Tested By

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