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Kerone Research & Development Centre (KRDC),
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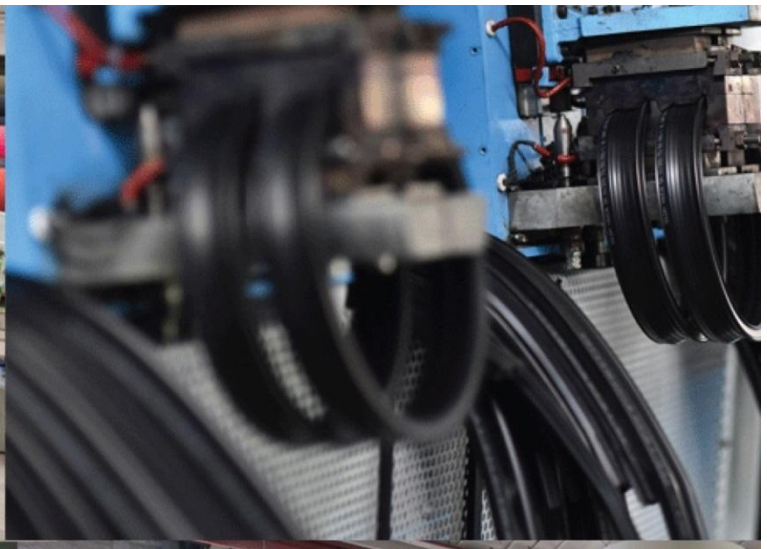

Batch Convection Heat Treatment on Cooked Food (Pulaw Rice, Pav Bhaji)

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

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Customer :	**M/s. Viren Shah**
Process :	**Batch Convection Heat Treatment on Pulaw Rice, Pav Bhaji**

TEST REPORT No: 62/KRDC/LAB/66 Mum 16/04/2022

Date Sample reception : 14/04/2022
ID : 62/LAB/16

SAMPLE DESCRIPTION:

Sampling : As Requested
Sample Condition : Acceptable
Quantity : approx. 500g each
Samples opening date : `14/04/2022
Product : Cooked Pav bhaji and Pulaw
Start Date test : 14/04/2022
End Date test : 15/04/2022

LABORATORY EXPERIMENTAL SETUP:

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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
No. of trays	6
Tray size (width*height*depth)	560 x 435 x25
Centrifugal Exhaust Blower	1440 rpm

ENVIRONMENT-LABORATORY AMBIENT CONDITIONS:

Temperature (^oC)	26^oC ($\pm5^oC$)
Humidity (%)	≤74% 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 cooked food to speed up the drying rate. For this experimental run, given sample has been placed on a SS tray and then placed in Horizontal Batch Convection Oven at certain decided temperature and time cycle. Observations are made on the final moisture content of sample weight and appearance of product.

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ANALYTICAL RESULTS:

Trial 1: Amar Pav Bhaji

Initial Wt. of Sample - 530 gms

Initial moisture – 76.9 %

Setting Temperature: 55°C

Sr. No	Cycle Time	Weight of Product (grams)	Weight loss in (%)	Product Temp. (°C)	Moisture Content (%)	Remarks, if any
1	After 2 hr.	294	44.5	35	63.1	Drying starts
2	After 4 hr.	152	48.3	41	30.6	Drying Continues
3	After 5 hr.	125	17.7	40	11.5	Variant of drying
4	After 30 min.	120	4	49	5.3	Dried effectively as desired

Total Cycle time- 5 hr 30 min.

Final Weight- 120gms.

Final weight loss- 77.35%

Final moisture – 5.3%

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Trial 2: Sardar Pav Bhaji

Initial Wt. of Sample - 500 gms

Initial moisture– 79.5%

Setting Temperature: 55°C

Sr. No	Cycle Time	Weight of Product (grams)	Weight loss in (%)	Product Temp. (°C)	Moisture Content (%)	Remarks, if any
1	After 2 hr.	284	43.2	37	71.5	Drying starts
2	After 4 hr.	135	52.4	47	51.3	Drying Continues
3	After 6 hr.	90	33.3	48	6.2	Dried effectively as desired

Total Cycle time- 6 hr.

Final Weight- 90 g

Final weight loss- 82%

Final moisture – 6.2%

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Trial 3: Amar Pulaw Rice

Initial Wt. of Sample - 483 gms

Initial moisture– 53.9 %

Setting Temperature: 55°C

Sr. No	Cycle Time	Weight of Product (grams)	Weight loss in (%)	Product Temp. (°C)	Moisture Content (%)	Remarks, if any
1	After 2 hr.	291	39.7	36	37.5	Drying starts
2	After 4 hr.	197	32.3	42	27.6	Drying Continues
3	After 5 hr.	155	21.3	50	3.2	Dried effectively as desired

Total Cycle time- 5hr

Final Weight- 155gms

Final weight loss- 67.9%

Final moisture- 3.2%

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BEFORE AND AFTER PICTURES OF TREATED SPECIMEN SAMPLE:

Trial	Untreated Sample	Treated Sample
1		
2		
3		

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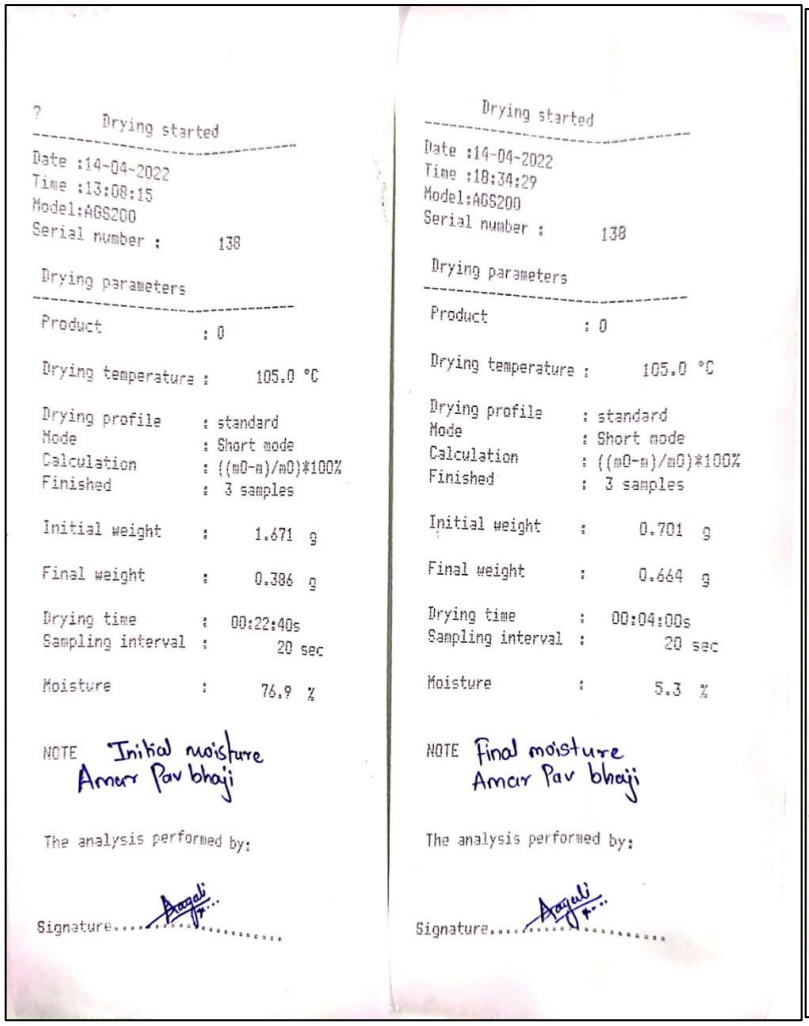
MOISTURE ANALYSIS REPORT:

Trail 1



? Drying started

Date :14-04-2022
Time :13:08:15
Model:AGS200
Serial number : 138

Drying parameters

Product : 0
Drying temperature : 105.0 °C
Drying profile : standard
Mode : Short mode
Calculation : ((m0-m)/m0)*100%
Finished : 3 samples
Initial weight : 1.671 g
Final weight : 0.386 g
Drying time : 00:22:40s
Sampling interval : 20 sec
Moisture : 76.9 %

NOTE Initial moisture Amar Pav bhaji

The analysis performed by:

Signature....

Drying started

Date :14-04-2022
Time :18:34:29
Model:AGS200
Serial number : 138

Drying parameters

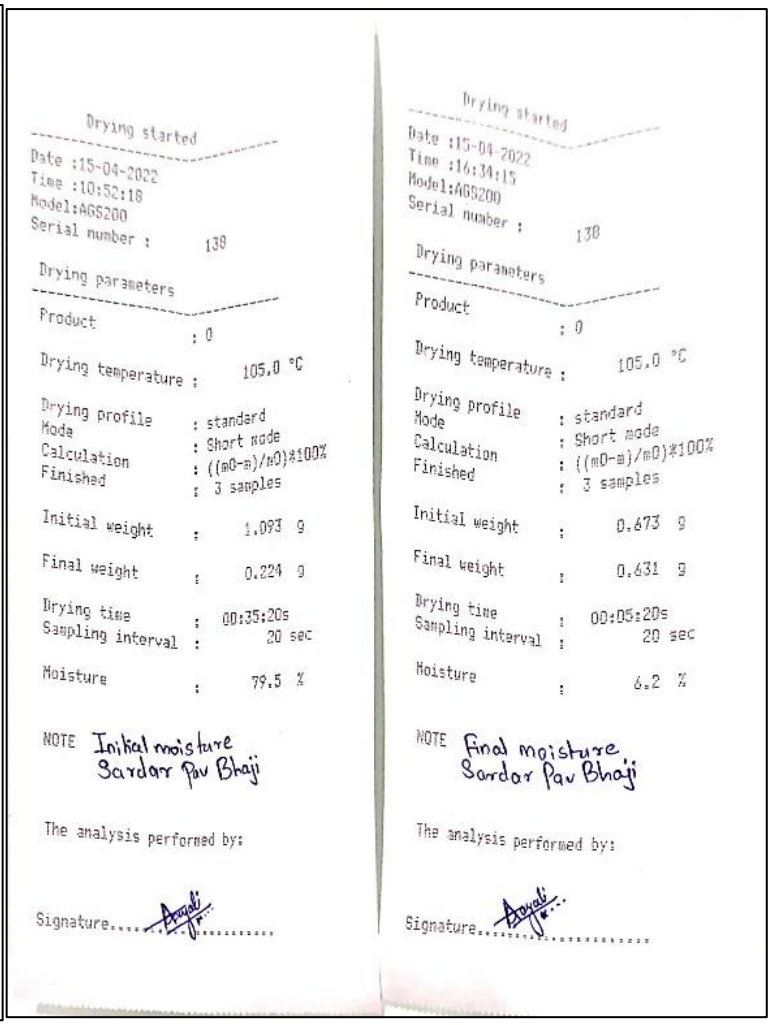
Product : 0
Drying temperature : 105.0 °C
Drying profile : standard
Mode : Short mode
Calculation : ((m0-m)/m0)*100%
Finished : 3 samples
Initial weight : 0.701 g
Final weight : 0.664 g
Drying time : 00:04:00s
Sampling interval : 20 sec
Moisture : 5.3 %

NOTE Final moisture Amar Pav bhaji

The analysis performed by:

Signature....

Trail 2



Drying started

Date :15-04-2022
Time :10:52:18
Model:AGS200
Serial number : 139

Drying parameters

Product : 0
Drying temperature : 105.0 °C
Drying profile : standard
Mode : Short mode
Calculation : ((m0-m)/m0)*100%
Finished : 3 samples
Initial weight : 1.093 g
Final weight : 0.224 g
Drying time : 00:35:20s
Sampling interval : 20 sec
Moisture : 79.5 %

NOTE Initial moisture Sardar Pav Bhaji

The analysis performed by:

Signature....

Drying started

Date :15-04-2022
Time :16:34:15
Model:AGS200
Serial number : 138

Drying parameters

Product : 0
Drying temperature : 105.0 °C
Drying profile : standard
Mode : Short mode
Calculation : ((m0-m)/m0)*100%
Finished : 3 samples
Initial weight : 0.673 g
Final weight : 0.631 g
Drying time : 00:05:20s
Sampling interval : 20 sec
Moisture : 6.2 %

NOTE Final moisture Sardar Pav Bhaji

The analysis performed by:

Signature....

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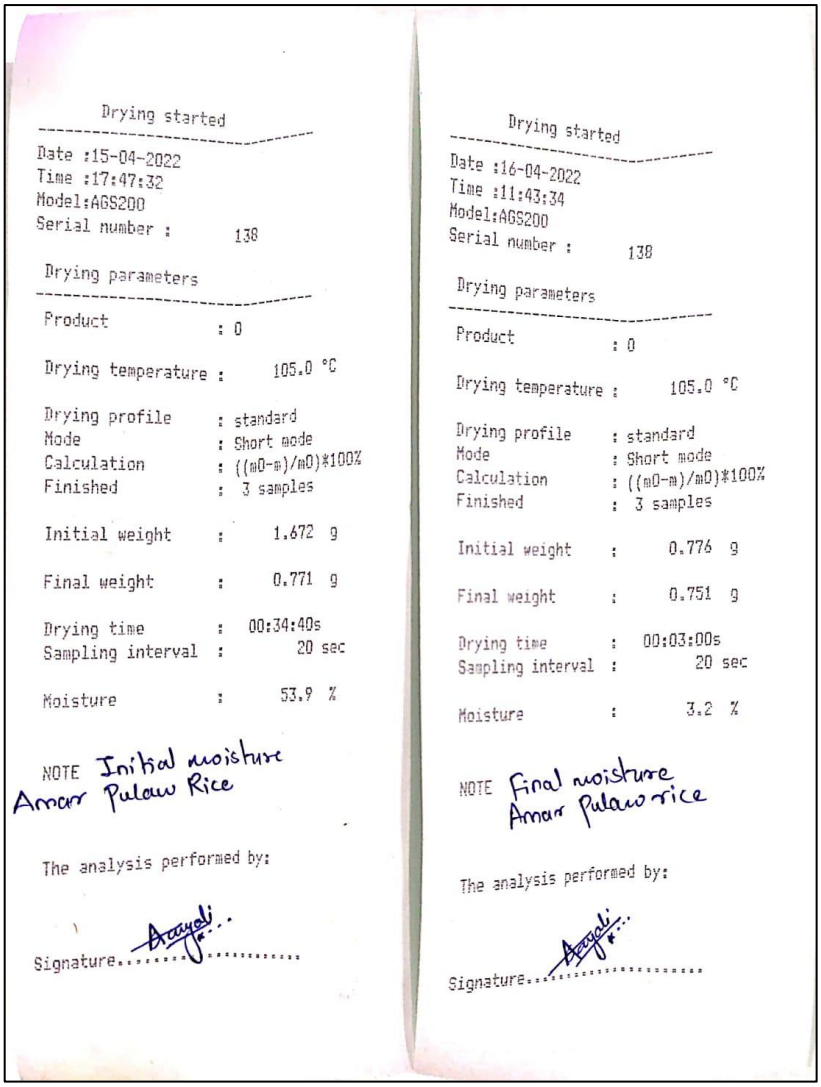
Trail 3



Drying started

Date :15-04-2022
Time :17:47:32
Model:AGS200
Serial number : 138

Drying parameters

Product : 0

Drying temperature : 105.0 °C

Drying profile : standard
Mode : Short mode
Calculation : ((m0-m)/m0)*100%
Finished : 3 samples

Initial weight : 1.672 g

Final weight : 0.771 g

Drying time : 00:34:40s
Sampling interval : 20 sec

Moisture : 53.9 %

NOTE Initial moisture Amar Pulao Rice

The analysis performed by:

Signature.....

Drying started

Date :16-04-2022
Time :11:43:34
Model:AGS200
Serial number : 138

Drying parameters

Product : 0

Drying temperature : 105.0 °C

Drying profile : standard
Mode : Short mode
Calculation : ((m0-m)/m0)*100%
Finished : 3 samples

Initial weight : 0.776 g

Final weight : 0.751 g

Drying time : 00:03:00s
Sampling interval : 20 sec

Moisture : 3.2 %

NOTE Final moisture Amar Pulao rice

The analysis performed by:

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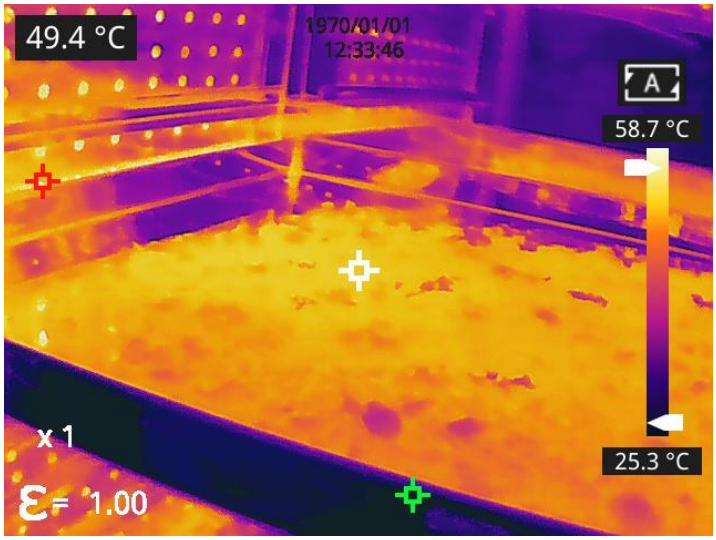
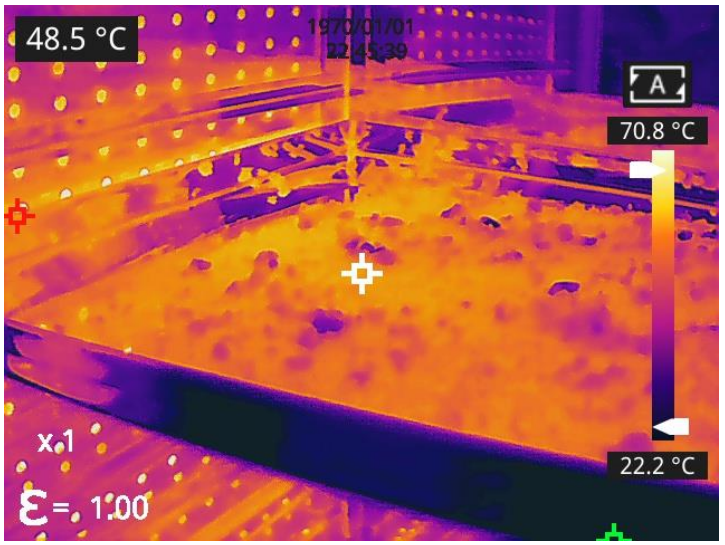
THERMAL ANALYSIS REPORTS:

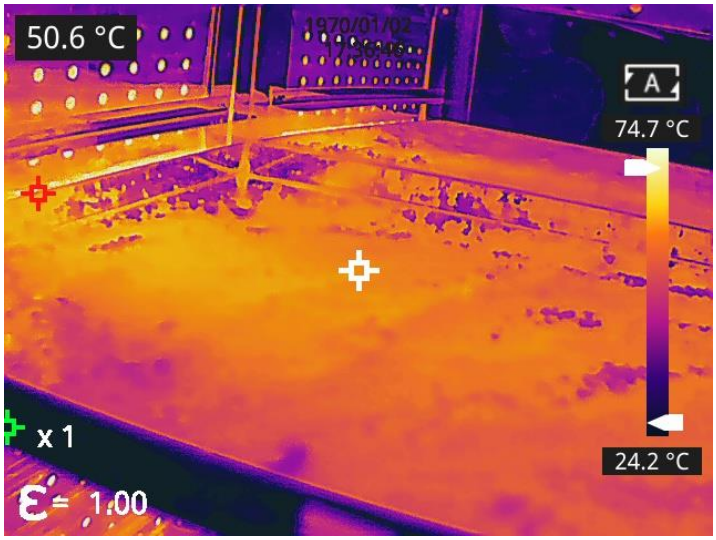
Trail 1



Trail 2



Trail 3



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OBSERVATIONS:

The Drying behavior of cooked Pav Bhaji and Pulaw rice has been investigated under the 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 drying time. As per physical investigation When product is allowed to dry steadily at comparatively lower temperature (around 55°C), the colour of product is mostly retained and dried without burning.

Ms. Sayali Asole
Tested By