The Pharma Innovation Journal 2023; SP-12(11): 902-907

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; SP-12(11): 902-907

www.thepharmajournal.com
Received: 22-09-2023
Accepted: 25-10-2023

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Standardization of blanching and sulphitation technique on physical parameters for dehydration of banana pseudo stem central core for powder making using cabinet dryer

Varsha GD, Desai Chirag, Mayani Jilen and Aniket Kumar Sahu

Abstract
The present investigation entitled "Standardization of blanching and sulphitation technique on physical parameters for dehydration of banana pseudostem central core for powder making using cabinet dryer" was carried with 16 treatments were fixed for preparation of powder using different combinations including pre-treatment of blanching (B_1-0 min., B_2-2 min., B_3-4 min. and B_4-6 min.) and sulphitation (S_1-0.0% KMS, S_2-0.1% KMS, S_3-0.2% KMS and S_4-0.3% KMS). The prepared blended powder was stored at room temperature for up to 6 months (0, 3 and 6 months) in 100 g aluminum laminated pouches. The results were statistically analyzed using a completely randomized design with factorial concept. The experiment revealed that maximum recovery (3.82%), minimum drying time (5.02 hr) and (5.14 hr) and highest total drying rate (114.28g/hr) and (112.67 g/hr) found without blanching (B_1) and sulphitation (S_1) respectively. While the interaction of B_1S_3 (without blanching and 0.2% KMS treatment) found maximum recovery (3.85%), minimum drying time (5.01 hr) and total drying rate (114.28 g/hr). The highest bulk density (0.649 gcm^{-3}), (0.597 gcm^{-3}) and (0.693 gcm^{-3}), maximum water holding capacity (548.98%), (543.74%) and (564.99%) although maximum oil absorption capacity (231.01%), (226.92%) and (232.60%) was found in 6 minutes blanching (B_4), 0.3 percent KMS (S_4) and $P_1B_4S_4$ (initial month of storage with 4 minutes blanching and 0.3% KMS treatment) respectively.

Keywords: Banana, pseudostem, blanching, sulphitation, dehydration

Introduction
Banana (*Musa* spp.) is one of the major fruit crop grown in India. It ranks second in area and production next to mango. Its year-round availability, affordability, varietal range, taste, nutritive and medicinal value make it the favorite fruit among all classes of people. In India, the area under banana increasing steadily because of higher returns as compared to other fruit crops. Similarly, with the technological development in banana cultivation, its productivity is also rising in trend. In Gujarat, more than 90 percent of the banana cultivating area is covered with Grand Naine variety. Grand Naine is more popular because of its early yield as compared to other varieties. Banana is rich source of nutrients and energy, which majorly consumed as table food in India. Banana fruit contains 75 g water per 100g, energy compositions 89 Kcal/100 g, dietary fibers 2.6 g/100 g, sugars 12.23 g/100 g, vitamin C 8.7 mg/100 g, carbohydrates 22.84 g/100 g and potassium 358 mg/100 g (Sidhu and Zafar, 2018) [10].

It is a monocarpic, monocotyledonous and herbaceous plant belonging to the family Musaceae and order Zingiberales. It has been suggested that cultivated bananas originated from the islands of South-East Asia with India as one of its origin and have been developed by the cross of *Musa accuminata* and *Musa balbisiana* and their natural hybrids which are originally found in the rainforests of South-East Asia. At present, banana is being cultivated throughout the warm tropical regions of the world between 30^0 N and 30^0 S of the equator. Banana is basically a tropical crop, grows well in a temperature range of 15 ºC to 35 ºC with relative humidity of 75 to 85 percent. It prefers tropical humid low lands and is grown from the sea level to an elevation of 2000 m above mean sea level.

Banana fruits are available throughout the year in the growing areas. However, its high production and short shelf life requires conversion into various value-added products *viz.*, banana puree, powder, wafers, flour, wine, jam, canned slice, flakes, vinegar, chutney, pickles, fruit bar, chocolates, *etc.* Apart from fruit, banana crop also generates huge biomass in the form of pseudostem, suckers and leaves, *etc.* The banana stem is called a pseudostem which is rich in fiber, and has great medicinal value too. The product could be consumed for its high medicinal value, high content of phenol and tannin imparting an astringent taste to the beverage (Abirami *et al.*, 2014) [1] however, its consumption is limited due to high phenols and iron content the immediate browning of the extracted juice has been problem for the commercial utilization of the juice.

At present, biomass is absolutely wasting in most of the states of India and Gujarat is not an exception to this. For disposing, presently farmers are spending about Rs. 12,000 to 15,000 per hac. Disposal of pseudostem in a routine way is done by dumping on field bunds, burning, disposing in natural drains, *etc.* Thus, causing environmental problems as well as becoming very good host for pathogen and insect growth. Banana pseudostem is mostly restricted to fiber extraction and products like handicrafts, paper production, *etc.* on a small scale. However, Navsari Agricultural University, Navsari has developed products under NAIP scheme funded by ICAR like banana pseudostem core candy, pickles, jam, jelly, squash, nectar, RTS, *etc.* Pseudostem juice is available in huge quantity and rich in potassium, iron and other nutraceutical properties. According to reports of CFTRI, Mysore there are no harmful components present in it and can be used as an edible processed product. In the past NAU scientists have worked on the development of nutraceutical beverages from the banana pseudostem juice and successfully prepared different types of beverages (Anon., 2015) [3].

The banana center core mainly comprises 90 percent moisture and hence cannot be kept for a long period of time and also has the property of quick oxidization because of the action of polyphenol oxidase. Pretreatments like blanching and potassium meta bisulphite (KMS) were used for minimal processing. Banana center core can be converted into flour which could be used to prepare bakery products, soup *etc.* Plant flours having high dietary fiber could be blended with wheat flour to increase the dietary fiber intake in the preparation of bakery products. Keeping in view of the wastage of banana pseudostem in plantations, the present study aimed to convert the fresh banana center core to flour which could have an extended shelf life and finds use in food application (Fagbemi, 1998) [4].

Materials and Methods

The experiment was carried out at the laboratories of Department of Post-Harvest Technology, ASPEE College of Horticulture and Forestry and Banana Pseudostem Processing Unit, Soil and Water Management Research Unit, Navsari Agricultural University, Navsari. The pseudostem of banana variety "Grand Naine" procured from fields of Soil and Water Management Research Unit, Navsari Agricultural University, Navsari in the 1st week of October were used in this study. Sixteen treatments with different combinations *viz.,* B_1S_1 - without blanching and sulphitation, B_1S_2 - (without blanching and 0.1% KMS treatment), B_1S_3 - (without blanching and 0.2% KMS treatment), B_1S_4 - (without blanching and 0.3% KMS treatment), B_2S_1 - (2 minutes blanching without sulphitation), B_2S_2 - (2 minutes blanching and 0.1% KMS treatment), B_2S_3 - (2 minutes blanching and 0.2% KMS treatment), B_2S_4 - (2 minutes blanching and 0.3% KMS treatment), B_3S_1 - (4 minutes blanching without sulphitation), B_3S_2 - (4 minutes blanching and 0.1% KMS treatment), B_3S_3 - (4 minutes blanching and 0.2% KMS treatment), B_3S_4 - (4 minutes blanching and 0.3% KMS treatment), B_4S_1 - (6 minutes blanching without sulphitation), B_4S_2 - (6 minutes blanching and 0.1% KMS treatment), B_4S_3 - (6 minutes blanching and 0.2% KMS treatment), B_4S_4 - (6 minutes blanching and 0.3% KMS treatment) were tried in Completely Randomized Design with factorial concept.

Methodology for preparation of banana pseudostem central core powder

Washed banana pseudostem central core were sliced using a slicer by adjusting it to an exact thickness of 4 mm. After slicing of banana pseudostem central core they were subjected to blanching at a temperature of 95 °C for 0, 2, 4 and 6 minutes as per treatment and after blanching the slices were immediately placed in cold water to stop the cooking process before subjecting to sulphitation. After treating slices with cold water, they were soaked in a solution of 0.0, 0.1, 0.2 and 0.3 percent concentration of potassium meta bisulphate (KMS) for ten minutes in order to control browning. Banana pseudostem central core powder was prepared by adopting pretreatments of blanching and sulphitation. Total 16 treatment combinations were fixed for preparation of powder using different blanching time (minutes) and sulphitation concentration (% KMS). The blanching temperature of 95 °C, slice thickness of 4 mm and cabinet dryer temperature of 65 °C were kept constant in all the treatments. The banana pseudostem central core powder was stored in aluminum laminated pouches for up to 6 months from October 2021 to March 2022 at room temperature varies from 20 to 35 ºC temperatures.

Experimental Results and Discussion

Physical Parameters

The moisture content of banana pseudostem central core was about 94.23 percent and the average weight of banana pseudostem was 720 g (per feet) whereas the outer sheaths weight was160 g and the obtained pseudostem central core was 560 g (per feet).

Recovery (%): Maximum mean recovery of 3.82 percent was observed in powder prepared without blanching (B_1) and sulphitation (S_1) while, the minimum recovery of 3.78 percent and 3.76 percent was observed in 4 minutes blanching (B_3) and 0.3 percent KMS (S_4) respectively. In case of interaction of blanching and sulphitation (B × S) highest recovery of 3.85 percent was observed in treatment combination of B_1S_3 (without blanching and 0.2% KMS treatment) while, the lowest recovery of 3.65 percent was observed in treatment combination of B_3S_4 (4 minutes blanching and 0.3% KMS treatment).

Table 1: Effect of blanching and sulphitation on recovery (%) of banana pseudostem central core powder

Recovery (%)					
Blanching time (B)	**Sulphitation (S)**				**Mean (B)**
	S1 – 0.0%	**S2 – 0.1%**	**S3 – 0.2%**	**S4 – 0.3%**	
B1- 0 min.	3.81	3.82	3.85	3.79	3.82
B2- 2 min.	3.80	3.83	3.82	3.78	3.81
B3- 4 min.	3.82	3.84	3.80	3.65	3.78
B4- 6 min.	3.83	3.75	3.79	3.82	3.80
Mean (S)	3.82	3.81	3.81	3.76	
	B	**S**		**B X S**	
S.Em±	0.020	0.020		0.040	
CD at 5%	NS	NS		NS	
CV%	1.82				

Drying Time (hr): Data regarding significantly the shortest mean drying time of 5.02 hr and 5.14 hr was observed in powder prepared without blanching (B_1) and sulphitation (S_1). While, significantly the longest drying time of (5.32 hr) and (5.19 hr) was observed in powder prepared by pretreatment of 6 minutes blanching (B_4) and 0.3 percent KMS (S_4) respectively. Interaction of blanching and sulphitation (B × S) shortest drying time of (5.01 hr) was observed in treatment combination of B_1S_3 (without blanching and 0.2% KMS treatment) while, the longest drying time of (5.36 hr) was observed in treatment combination of B_4S_4 (6 minutes blanching and 0.3% KMS treatment). Drying time increased significantly with increase in blanching time this may be due to the phenomenon caused by gelatinization. The blanching temperature (95 ºC) is high enough to cause gelatinization. When the samples blanching in the water, the heat energy broke the hydrogen bonds and water started absorbing into starch granule. With the high temperature, water forms hydrogen bonds with amylose and amylopectin and the amount of free water outside granule decreases. The starch granules lost their organized structure and formed amorphous networks of starch and water. After blanching, the samples were cooled in ice water, which coursed retrogradation. Principally, starch retro gradation could be defined as a process where molecules comprising gelatinized starch rearrange into an ordered structure to retrieve a crystalline order (Karlsson *et al.*, 2003) [5]. Since the bound water in the samples increased during the blanching process and with the blanching time, it took longer time for blanched samples to dry. Similar results were found in (Ma *et al.*, 2016) [7] in species of *Musa balbisiana* and *Musa acuminate.*

Table 2: Effect of blanching and sulphitation on drying time (hr) of banana pseudostem central core powder

Drying time (hr)					
Blanching time (B)	Sulphitation (S)				Mean (B)
	S_1 – 0.0%	S_2 – 0.1%	S_3 – 0.2%	S_4 – 0.3%	
B_1- 0 min.	5.04	5.03	5.01	5.02	5.02
B_2- 2 min.	5.07	5.10	5.12	5.16	5.11
B_3- 4 min.	5.17	5.19	5.19	5.23	5.20
B_4- 6 min.	5.29	5.30	5.32	5.36	5.32
Mean (S)	5.14	5.15	5.16	5.19	
	B	S		B X S	
S.Em ±	0.018	0.018		0.036	
CD at 5%	0.053	NS		NS	
CV%	1.23				

Total Drying Rate (g/hr): Significantly the mean highest total drying rate (114.28 g/hr) and (112.67 g/hr) was observed in powder prepared without blanching B_1 and sulphitation (S_1) respectively. While, the lowest total drying rate (109.31 g/hr) and (110.90 g/hr) were observed in powder prepared by pretreatment of 6 minutes blanching (B_4) and 0.3 percent KMS (S_4) respectively. The drying rate decreased with increase in blanching time. This might be due to bound water in the samples increased during the blanching process and with the blanching time, it took longer time for blanched samples to dry. Decreased drying rate with increase in blanching time is in close conformity with the findings of (Ma *et al.*, 2016) [7] in species of *Musa balbisiana* and *Musa acuminate.* Interaction of blanching and sulphitation (B × S) highest total drying rate of 114.76 g/hr was observed in treatment combination of B_1S_3 (without blanching and 0.2% KMS treatment) while, the lowest total drying rate of 108.57 g/hr in treatment combination of B_4S_4 (6 minutes blanching and 0.3% KMS treatment).

Table 3: Effect of blanching and sulphitation on total drying rate (g/hr) of banana pseudostem central core powder

Total drying rate (g/hr)					
Blanching (B)	Sulphitation (S)				Mean (B)
	S_1 – 0.0%	S_2 – 0.1%	S_3 – 0.2%	S_4 – 0.3%	
B_1- 0 min.	113.80	114.67	114.76	113.91	114.28
B_2- 2 min.	114.18	112.94	112.67	111.62	112.85
B_3- 4 min.	112.07	111.67	110.80	109.25	110.95
B_4- 6 min.	110.65	109.19	108.57	108.83	109.31
Mean (S)	112.67	112.12	111.70	110.90	
	B	S		B X S	
S.Em±	0.823	0.823		1.646	
CD at 5%	2.381	NS		NS	
CV%	2.55				

Bulk Density (gcm^{-3}): It was observed that significantly the highest bulk density of (0.649 gcm^{-3}) and (0.597 gcm^{-3}) was observed in powder prepared by pretreatment of 6 minutes blanching (B_4) and 0.3 percent KMS (S_4) respectively. Bulk density increased significantly with increase in blanching time this might be due to gelatinization of carbohydrates and swelling of fiber that have occurred during the blanching of the central core. This leads to increased water absorption capacity of powder there by increasing the bulk density (Akubor 2003) [2]. The increased bulk density with increase in blanching time is in close conformity with the findings of Oluwalana *et al.* (2011) [8] in plantain (*Musa paradisiaca*) flour. The storage of central core powder resulted significant decrease in mean bulk density from initial month 0.620 to 0.549 gcm^{-3} at six months of storage. Interaction of blanching and sulphitation (B × S) depicted the highest bulk density of

0.693 gcm^{-3}, 0.658 gcm^{-3} and 0.641 gcm^{-3} at 0, 3 and 6 months of storage respectively were observed in treatment combination of B_4S_4 (6 minutes blanching and 0.3% KMS treatment) and interaction of blanching and storage (B × P) maximum bulk density of 0.681gcm^{-3} was observed in treatment of 6 minutes blanching at initial month of storage. Although the interaction of blanching-sulphitation and storage (B × S × P) the highest bulk density of 0.693 gcm^{-3} was recorded in $P_1B_4S_4$ (initial month of storage with 4 minutes blanching and 0.3% KMS treatment).

Table 4: Effect of blanching and sulphitation on bulk density (gcm^{-3}) of pseudostem central core powder during storage

Bulk density (gcm^{-3})							
Storage (P)	Blanching (B)	Sulphitation (S)				Mean (S×P) Mean (P)	Mean (B)
		S_1 - 0.0%	S_2 - 0.1%	S_3 – 0.2%	S_4 - 0.3%		
0 Month (P1)	B_1- 0 min.	0.523	0.529	0.529	0.547	0.532	
	B_2- 2 min.	0.598	0.610	0.625	0.630	0.616	
	B_3- 4 min.	0.638	0.649	0.662	0.663	0.653	
	B_4- 6 min.	0.672	0.674	0.684	0.693	0.681	
	Mean (S×P)	0.608	0.616	0.625	0.633	0.620	
3 Month (P2)	B_1- 0 min.	0.468	0.483	0.494	0.500	0.486	
	B_2- 2 min.	0.561	0.562	0.576	0.589	0.572	0.488
	B_3- 4 min.	0.600	0.611	0.617	0.626	0.613	0.576
	B_4- 6 min.	0.629	0.641	0.653	0.658	0.645	0.618
	Mean (S×P)	0.564	0.574	0.585	0.593	0.579	0.649
6 Month (P3)	B_1- 0 min.	0.427	0.435	0.457	0.460	0.445	
	B_2- 2 min.	0.522	0.538	0.547	0.555	0.540	
	B_3- 4 min.	0.570	0.578	0.600	0.603	0.588	
	B_4- 6 min.	0.608	0.609	0.626	0.641	0.621	
	Mean (S×P)	0.532	0.540	0.557	0.565	0.549	
	Mean (S)	0.568	0.577	0.589	0.597		
	B	S	B X S	P	B X P	S X P	B X S X P
S.Em±	0.003	0.003	0.006	0.002	0.005	0.005	0.009
CD at 5%	0.009	0.009	NS	0.006	NS	NS	NS
CV%	Main plot factor: 2.92			Sub plot factor: 2.70			

Water Holding Capacity (%): Data regarding the highest water holding capacity of 548.98 and 543.74 percent was observed in powder prepared by pretreatment of 6 minutes blanching (B_4) and 0.3 percent KMS (S_4) respectively. Water holding capacity increased significantly with increase in blanching time this might be due to the effect of heat on the water binding sites of the central core proteins. Heat disassociates the major proteins into subunits that have more water binding sites than the native or oligomeric proteins (Onimawo and Akubor, 2012) [9]. The denatured proteins bind more water than native proteins (Kinsella, 1987) [6]. Gelatinization of carbohydrates and swelling of fiber may have occurred during the heating of the central core. This leads to increased water absorption capacity of powder (Akubor, 2003) [2]. Storage of central core powder resulted significant decrease in mean water holding capacity from initial month of 550.62 to 522.94 percent at six months of storage. Interaction of blanching and sulphitation (B × S) depicted the highest water holding capacity of 564.99, 561.68 and 540.09 percent at 0, 3 at 6 months of storage were observed respectively in treatment combination of B_4S_4 (6 minutes blanching and 0.3% KMS treatment), interaction of blanching and storage (B × P) maximum water holding capacity of 558.59% was observed in treatment of 6 minutes blanching at the initial month of storage. While, interaction of sulphitation and storage (S × P) maximum water holding capacity of 553.50% was observed in treatment of 0.3% KMS at initial month of storage and interaction of blanching-sulphitation and storage (B × S × P) highest water holding capacity of 564.99% was recorded in $P_1B_4S_4$ (initial month of storage with 6 minutes blanching and 0.3% KMS treatment). Similar results were observed in (Fagbemi, 1998) [4] in plantain (*Musa aab*) flour.

Oil Absorption Capacity (%): It was observed that the mean oil absorption capacity significantly the highest oil absorption capacity of 231.01 and 226.92 percent was observed in powder prepared by pretreatment of 6 minutes blanching (B_4) and 0.3 percent KMS (S_4) respectively. Oil absorption capacity increased with increase in blanching time. This was probably due to protein denaturation which might have masked the non-polar residues from the interior of the protein molecule (Kinsella, 1987) [6]. The mechanism of oil absorption is known to be mainly due to the physical entrapment of oil by capillary action in the hydrophobic components of the proteins. This result is in close conformity with the findings of (Yasaswini *et al*., 2021) [11] in Grand-9 tender banana pseudo-stem flour. Storage of central core powder resulted significant decrease in mean oil absorption (P) from initial month of 226.57 to 224.05 percent at six months of storage. Interaction of blanching and sulphitation (B × S) depicted the highest oil absorption capacity of 232.60, 231.03 and 232.20 percent at 0,3 and 6 months of storage respectively were observed in treatment combination of B_4S_4 (6 minutes blanching and 0.3% KMS treatment), the interaction of blanching and storage (B × P) maximum oil absorption capacity of 231.40% was observed in treatment of 6 minutes blanching at initial month of storage while, interaction of sulphitation and storage (S × P) maximum oil absorption capacity of 227.72 percent was observed in 0.3% KMS at initial month of storage. Interaction of blanching-sulphitation and storage (B × S × P) highest oil absorption capacity of 232.60% was recorded in $P_1B_4S_4$ (initial month of storage with 6 minutes blanching and 0.3% KMS treatment).

Table 5: Effect of blanching and sulphitation on water holding capacity (%) of pseudostem central core powder during storage

Water holding capacity (%)							
Storage (P)	**Blanching (B)**	**Sulphitation (S)**				**Mean (B×P)**	**Mean (B)**
		S_1 - 0.0%	**S_2 - 0.1%**	**S_3 - 0.2%**	**S_4 - 0.3%**	**Mean (P)**	
0 Month(P1)	B_1- 0 min.	539.54	541.62	544.17	545.26	542.65	
	B_2- 2 min.	547.25	548.75	549.03	550.70	548.93	
	B_3- 4 min.	551.28	551.99	552.91	553.07	552.31	
	B_4- 6 min.	554.35	554.82	560.21	564.99	558.59	
	Mean (S×P)	548.11	549.29	551.58	553.50	550.62	
3 Month(P2)	B_1- 0 min.	529.57	534.68	536.75	540.46	535.37	530.69
	B_2- 2 min.	542.82	543.63	544.09	545.68	544.05	537.64
	B_3- 4 min.	546.69	547.58	548.32	548.73	547.83	541.56
	B_4- 6 min.	551.19	551.43	556.16	561.68	555.12	548.98
	Mean (S×P)	542.57	544.33	546.33	549.14	545.59	
6 Month(P3)	B_1- 0 min.	504.30	514.93	516.88	520.06	514.05	
	B_2- 2 min.	516.15	518.75	521.07	523.83	519.95	
	B_3- 4 min.	519.56	522.28	525.94	530.33	524.53	
	B_4- 6 min.	527.36	531.00	534.46	540.09	533.23	
	Mean (S×P)	516.84	521.74	524.59	528.58	522.94	
	Mean (S)	535.84	538.45	540.83	543.74		
	B	S	B X S	P	B X P	S X P	B X S X P
S.Em±	2.495	2.495	4.99	2.417	4.834	4.834	9.668
CD at 5%	7.187	NS	NS	6.828	NS	NS	NS
CV%	Main plot factor: 2.77			Sub plot factor: 3.10			

Table 6: Effect of blanching and sulphitation on oil absorption capacity (%) of pseudostem central core powder during storage

Oil absorption capacity (%)							
Storage (P)	**Blanching (B)**	**Sulphitation (S)**				Mean (B×P)	**Mean (B)**
		S_1 - 0.0%	**S_2** - 0.1%	**S_3** – 0.2%	**S_4** - 0.3%	**Mean (P)**	
0 Month(P1)	B_1- 0 min.	218.61	221.49	221.73	222.28	221.03	
	B_2- 2 min.	223.62	223.80	226.46	226.66	225.13	
	B_3- 4 min.	228.21	228.51	228.83	229.34	228.73	
	B_4- 6 min.	229.87	231.21	231.90	232.60	231.40	
	Mean (S×P)	225.08	226.26	227.23	227.72	226.57	
3 Month(P2)	B_1- 0 min.	218.11	219.88	221.40	221.83	220.30	219.72
	B_2- 2 min.	223.29	223.56	224.79	226.04	224.42	224.03
	B_3- 4 min.	226.23	226.75	226.98	230.09	227.51	227.06
	B_4- 6 min.	230.54	230.57	230.79	231.03	230.73	231.01
	Mean (S×P)	224.54	225.19	225.99	227.25	225.74	
6 Month(P3)	B_1- 0 min.	215.51	215.80	219.44	220.59	217.84	
	B_2- 2 min.	221.25	221.57	223.61	223.70	222.53	
	B_3- 4 min.	223.82	224.21	225.00	226.68	224.93	
	B_4- 6 min.	228.91	231.16	231.38	232.20	230.91	
	Mean (S×P)	222.37	223.18	224.86	225.79	224.05	
	Mean (S)	223.99	224.87	226.02	226.92		
	B	S	B X S	P	B X P	S X P	B X S X P
S.Em±	0.624	0.624	1.248	0.531	1.062	1.062	2.124
CD at 5%	1.798	1.798	NS	1.500	NS	NS	NS
CV%	Main plot factor: 1.66			Sub plot factor: 1.63			

Conclusion
From the foregoing results, it can be concluded that the best quality powder with high recovery percentage, shortest drying time and higher total drying rate was found in B_1S_3 (without blanching and 0.2% KMS treatment while, highest bulk density, water holding capacity, oil absorption capacity was recorded in B_4S_4 (4 minute blanching and 0.3% KMS treatment). It can be stored successfully for 6 months in aluminum laminated pouches at ambient temperature. Therefore, it will be helpful for profitable utilization of banana pseudostem central core and also for development of different value added products.

Acknowledgement
The authors are thankful to the Dean, and thank to Navsari Agricultural University, Navsari for providing necessary facilities to conduct research and of Excellence on PHT, ASPEE, College of Horticulture and Forestry, Navsari for necessary support. I would like to thank all my advisory members and my colleagues in successful completion of my research work.

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