



E-ISSN: 2320-7078

P-ISSN: 2349-6800

www.entomoljournal.com

JEZS 2020; 8(5): 1058-1062

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Received: 25-07-2020

Accepted: 28-08-2020

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A study on the availability and utilization of dried milk in Kashmir

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Abstract

The current investigation was undertaken with the aim of ascertaining the availability and utilization status of milk powder (SMP and WMP) in Kashmir. For this purpose a survey on various households and commercial establishments was undertaken. A total of 240 respondents from households and 120 from commercial establishments (wholesellers, retailers, tea stallers) were asked to respond to respective questionnaires. The results revealed that the households and commercial establishments preferred Sifti brand and Skim milk powder class for milk powder. Tins were mostly preferred by the commercial establishments and major utilization of milk powder was for making beverages. Marriages had a great influence on purchase of milk powder. The majority of households on an average consumed upto 1 kg of milk powder per month.

Keywords: Skim milk powder, whole milk powder

Introduction

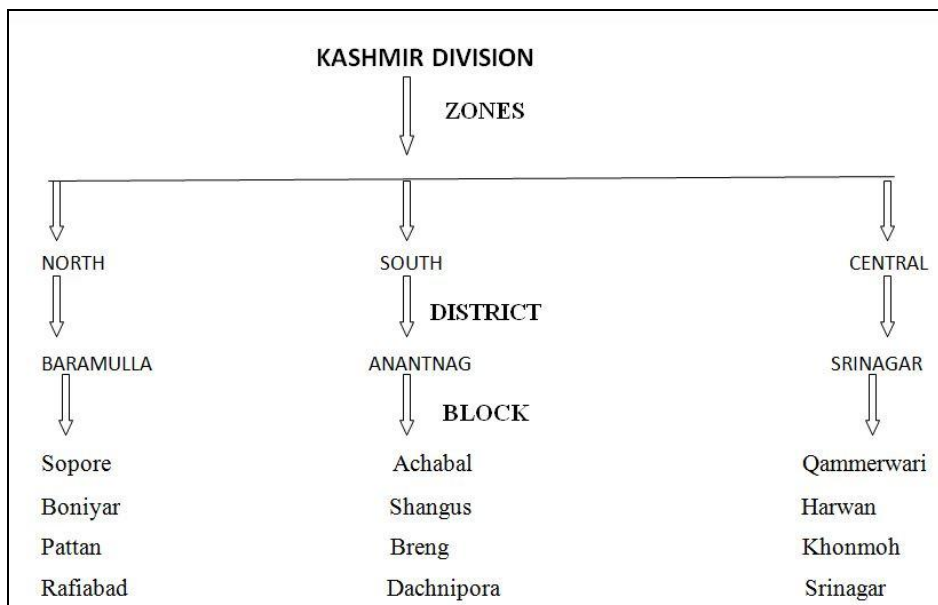
Milk production in India has witnessed a significant growth and is reported to have recorded about eight fold growth from about 22 million tonnes in 1970-1971 to 176.35 million tonnes in 2017-2018 [3]. The growth in milk production has outpaced the growth in the population and food grain production, resulting in the significant increase from 112 grams per day in 1970-1971 to about 355 grams per day (per capita availability) in 2017-2018, thus contributing towards the nutritional security of masses. Increase in production has necessitated the need for employing effective methods of preservation of milk in order to prevent losses occurring due to spoilage of milk. This would also pave way to the regional and seasonal surpluses to be salvaged effectively.

Milk is a highly nutritious food that serves as an excellent growth medium for a wide range of microorganisms [4]. Converting milk into milk powder increases its shelf life and enables it to be stored for extended period (about 1 year) without substantial loss of quality even at ambient temperatures. The dairy-based powders are not only used for recombination or reconstitution, but they can be exploited for their intrinsic functional properties for application as a food ingredient in several "value-added foods" such as confectionery, bakery, and meat products [5]. Dried milk powder must exhibit high quality in sensory, nutritional and microbiological attributes at the time of purchase [1]. The consumer uses the milk powder in hot beverages, frozen desserts, cheese, yoghurt, bakery products, soaps and baby food items [2].

Materials and methods

Sampling plan

To find out the utilization status of milk powders in Kashmir division a survey of various households and commercials was conducted. A purposive sampling plan was followed in which, the valley was divided into three zones: North, South, and Central. Further, from each zone one district was selected randomly and from each district four blocks were selected (randomly).



- A total of 240 respondents were selected from various households, and were asked to answer a questionnaire.
- A total of 120 respondents in the relevant market supply including (wholesalers, retailers, tea stallers) were also requested to respond to the questions devised for them.

Results

Household survey

Data obtained from survey is given below:

Personal profile of respondents

Age

Table-1 reveals that majority of the respondents belonged to young age group of 21-40 years (71.66%) followed by middle age group 41-60 (23.33%) then by old age group 61-80 (5.00%).

Table 1: Distribution of respondents with respect to their personal profile

Profile	Zones			Pooled
	Central	South	North	
Age (Yrs)				
Young (21-40)	49 (61.25)	67 (83.75)	56 (70.00)	172 (71.66)
Middle (41-60)	26 (32.5)	10 (12.50)	20 (25.00)	56 (23.33)
Old (61-80)	5 (6.25)	3 (3.75)	4 (5.00)	12 (5.00)
Grand total	80	80	80	240
Gender				
Male	42 (52.50)	43 (53.75)	40 (50.00)	125 (52.08)
Female	38 (47.5)	37 (46.25)	40 (50.00)	115 (47.92)
Grand total	80	80	80	240
Type of family				
Nuclear	66 (82.50)	55 (68.75)	70 (87.50)	191 (79.58)
Joint	14 (17.50)	25 (31.25)	10 (12.5)	49 (20.41)
Grand total	80	80	80	240
Family size				
Small (1-5)	58 (72.50)	35 (43.75)	66 (82.50)	159 (66.25)
Medium (6-10)	20 (25.00)	37 (46.25)	13 (16.25)	70 (29.16)
Large (11-15)	2 (2.50)	8 (10.00)	1 (1.25)	11 (4.59)
Grand total	80	80	80	240

Figures in parenthesis represent the percent of total respondents in the zone

Gender

Table-1 reveals that majority of the respondents in the study were males (52.08%).

Family type

Table-1 shows that majority of the families (79.58%) were living in nuclear families.

Family size

Table-1 reveals that majority of the families belonged to small size group of 1-5 members (66.25%) followed by medium size group of 6-10 members and then by large size group of 11-15 members respectively.

Preference for Consumption/ Non consumption of milk powder

The three zones were compared i.e central, south and north in terms of consumption or non consumption of milk powder as given in table- 2. As it is evident from the table, central and south zones consumed highest (98.75%) while north zone consumed 78.75%, with the overall consumption of 92.08%. Also in central and south zone non consumption was seen as 1.25%, while in north zone it was seen as 21.25%, with the overall value of 7.91%.

Table 2: Distribution of respondents in terms of preference for Consumption / Non consumption of milk powder

Consumption/non consumption	Zones			Pooled
	Central	South	North	
Consumption	79 (98.75)	79 (98.75)	63 (78.75)	221 (92.08)
Non Consumption	1 (1.25)	1 (1.25)	17 (21.25)	19 (7.91)
Grand total	80	80	80	240

Figures in parenthesis represent the percent of total respondents in the zone

Quantity of milk powder consumed per month

The three zones were compared i.e central, south and north in terms of consumption pattern of milk powder per month as given in table-3. It was found that maximum consumption of upto 1 kg of milk powder was seen in the north zone (73.50%), followed by central zone (62.05%) and then south (40.50%) with the overall consumption of 57.46%.

It was found that maximum consumption of 1.9-2 kg of milk powder was seen in south zone (46.25%), followed by central (36.25%) and then by north (18.75%) with the overall consumption of 33.75%. Further, 2.1-3kg of milk powder was largely consumed by south (12.50%), followed by north (2.47%) and then central (1.25%) zone, with overall consumption of 5.41%.

Table 3: Distribution of respondents in terms of quantity of milk powder consumed per month

Quantity (kg)	Zones			Pooled
	Central	South	North	
Upto 1	49 (62.05)	32 (40.50)	46 (73.50)	127 (57.46)
1.1-2	29 (36.70)	37 (46.83)	15 (23.80)	81 (36.65)
2.1-3	1 (1.26)	10 (12.65)	2 (3.17)	13 (5.88)
Grand total	79	79	63	221

Figures in parenthesis represent the percent of total respondents in the zone

Major utilization of milk powders

The three zones were compared i.e central, south and north among themselves in terms of utilization pattern of milk powder per month as given in table-4. It was found that maximum utilization of milk powder as beverages was seen in the north zone (82.50%), followed by central zone (82.27%) and then by south (70.88%) with the overall consumption of 78.28%.

Table 4: Distribution of respondents in terms of major utilization of milk powders

Utilization	Zones			Pooled
	Central	South	North	
Beverages	65 (82.27)	56 (70.88)	52 (82.50)	173 (78.28)
Processed milk	1 (1.26)	19 (24.05)	3 (4.76)	23 (10.40)
Product preparation	13 (16.45)	4 (5.06)	8 (12.69)	25 (11.31)
Grand total	79	79	63	221

Figures in parenthesis represent the percent of total respondents in the zone

As given in the table-4 processed milk was maximum consumed by south zone (24.05%), followed by north zone (4.76%) and then by central (1.26%), with the overall consumption of 10.40%. As given in the table-4 utilization of milk powder as product preparation was maximum seen in central zone (16.45%), followed by north zone (12.69%) and then by south (5.06%), with the overall consumption of 11.31%.

Preference for type of milk powder

The three zones were compared i.e central, south and north

among themselves in terms of preference for particular type of milk powder as given in table-5. It was found that maximum consumption of whole milk powder was seen in the central zone (46.83%), followed by north zone (46.03%) and then by south (37.97%) with the overall consumption of 43.43%.

It was found that maximum consumption of skim milk powder was seen in the south zone (62.03%), followed by north zone (53.96%) and then by central (53.17%) with the overall consumption of 56.57%.

Table 5: Distribution of respondents in terms of preference for class of milk powder

Class of milk powder	Zones			Pooled
	Central	South	North	
Whole milk	37 (46.83)	30 (37.97)	29 (46.03)	96 (43.43)
Skim milk	42 (53.17)	49 (62.02)	34 (53.96)	125 (56.56)
Grand total	79	79	63	221

Figures in parenthesis represent the percent of total respondents in the zone

Preference for particular brand

The three zones were compared i.e central, south and north within themselves in terms of preference for particular brand of milk powder as given in table-6. It was found that maximum consumption of sifti was seen in the south zone (67.50%), followed by north zone (64.56%) and then by central zone (60.00%) with the overall consumption of 63.75%.

It was found that maximum consumption of verka was seen in the central zone (37.50%), followed by south zone (30.00%) and then by north zone (13.75%) with the overall consumption of 27.08%. It was found that consumption of nestle brand of milk powder was seen uniformly in all three zones central zone, south zone and north zone (1.25%) with the overall consumption of 1.25%.

Table 6: Distribution of respondents in terms of preference for particular brand

Brand	Zones			Pooled
	Central	South	North	
Sifti	48 (60.00)	54 (67.50)	51 (64.56)	153 (63.75)
Verka	30 (37.5)	24 (30.00)	11 (13.75)	65 (27.08)
Nestle	1 (1.25)	1 (1.25)	1 (1.25)	3 (1.25)
Grand total	79	79	63	221

Figures in parenthesis represent the percent of total respondents in the zone

Seasonal influences and others

The three zones were compared i.e. central, south and north within themselves in terms of seasonal and other influences in the purchase of milk powder as given in table-7. Summer season mostly influenced central zone (24.05) followed by south (11.39%) and then by north (3.80%) with the overall mean of 14.02%.

Winter season mostly influenced south zone (50.60%), followed by central (37.97%) and then by north (8.75%) with

the overall mean of 34.84%. As it is evident from the table-7 marriages mostly influence north zone (65.82%), followed by central and south zone (37.97%) with the overall mean of 51.13%.

Table 7: Distribution of respondents in terms of seasonal and other influences on purchase of milk powders

Influences	Zones			Pooled
	Central	South	North	
Summer	19 (24.05)	9 (11.39)	3 (3.80)	31 (14.02)
Winter	30 (37.97)	40 (50.6)	7 (8.75)	77 (34.84)
Marriages	30 (37.97)	30 (37.97)	53 (65.82)	113 (51.13)
Grand total	79	79	63	221

Figures in parenthesis represent the percent of total respondents in the zone

Source of milk powders

Market was the only source of milk powders seen in all the three zones.

Reason for consumption

Long shelf life was seen as reason of consumption of milk powder in all the three zones.

Table 8: Distribution of respondents in terms of reasons for consumption of milk powder

Reason	Zones			Pooled
	Central	South	North	
Long Shelf Life	79 (98.75)	79 (98.75)	63 (78.75)	221 (92.5)
Grand total	79	79	63	221

Figures in parenthesis represent the percent of total respondents in the zone

Market supply chain survey

Data obtained is given below

Business establishment type

Table-9 reveals that total percentage of wholesalers was 12.50%, that of retailers was 62.50% and tea stallers was 25.00%.

Table 9: Distribution of respondents in terms of business establishment type

Establishment type	Zones			Pooled
	Central	South	North	
Wholesaler	5 (12.50)	5 (12.50)	5 (12.50)	15 (12.50)
Retailer	25 (62.50)	25 (62.50)	25 (62.50)	75 (62.50)
Tea stalls	10 (25.00)	10 (25.00)	10 (25.00)	30 (25.00)
Grand total	40	40	40	120

Figures in parenthesis represent the percent of total respondents in the zone

Age

Table-10 reveals that majority of the respondents belonged to

Table 12: Distribution of respondents in terms of class preference of consumers as perceived by commercials

Class preference	Zones			Overall
	Central	South	North	
Skim milk	17 (42.50)	15 (37.50)	32 (80.00)	64 (53.33)
Whole milk	23 (57.50)	25 (62.50)	8 (20.00)	56 (46.66)
Grand total	40	40	40	120

Figures in parenthesis represent the percent of total respondents in the zone.

middle age group of 39-58 years (59.17%) followed by young age group 19-38 years (33.33%) then by old age group of 59-78 years (7.5%).

Table 10: Distribution of respondents in terms of personal profile of commercial establishments

Profile	Zones			Pooled
	Central	South	North	
Age (yrs)				
Young (19-38)	6 (15.00)	20 (50.00)	14 (35.00)	40 (33.33)
Middle (39-58)	31 (77.50)	18 (45.00)	22 (55.00)	71 (59.17)
Old (59-78)	3 (7.50)	2 (5.00)	4 (10.00)	9 (7.5)
Grand total	40	40	40	120
Gender				
Male	40 (100.00)	40 (100.00)	40 (100.00)	120 (100.00)
Female	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Grand Total	40	40	40	120

Figures in parenthesis represent the percent of total respondent's in the zone

Gender

Table-10 reveals that all the respondents in the market supply chain study were males (100.00%).

Preference of commercial establishments in terms of Packaging form of milk powder

Table-11 reveals that highest percentage of tins were used by the central zone (75.00%), followed by north zone (60.00%) then by south zone (37.50%) with the overall mean of 57.50%. Highest percentage of polypouches were used in south zone (62.50%), followed by north (37.50%), then by central zone (17.50%) with the overall mean of 39.17%. Other packaging material was used by 7.50% in central zone, followed by north zone 2.50% with the overall mean of 3.33%.

Table 11: Distribution of respondents in terms of packaging form of milk powders preferred by commercials

Packaging	Zones			Overall
	Central	South	North	
Polypouches	7 (17.50)	25 (62.50)	15 (37.50)	47 (39.17)
Tins	30 (75.00)	15 (37.50)	24 (60.00)	69 (57.50)
Others	3 (7.50)	0 (0.00)	1 (2.50)	4 (3.33)
Grand total	40	40	40	120

Figures in parenthesis represent the percent of total respondents in the zone.

Class preference of consumers as perceived by commercial establishments

Table-12 reveals that highest percentage of skim milk powder was used by north zone (80.00%), followed by central zone (42.50%), then by south (37.50%), with the overall mean of 53.33%. Highest percentage of whole milk powder was used by south zone (62.50%), followed by central zone (57.50%), followed by north (20.00%) with the overall mean of 46.66%.

Quantity of milk powder handled by commercial establishments per month

Table-13 reveals that the majority of the wholesalers (29.17%) handled 10,000- 12,000 kg of milk powder per month, the majority of retailers (20.00%) handled 20-25kg of milk powder per month. While majority of tea stallers (11.67%) handled 5-10 kg of milk powder per month.

Table 13: Distribution of respondents in terms of quantity of milk powder handled by commercials per month

Quantity (kgs)	Zones			Pooled
	Central	South	North	
Wholesalers				
10,000-12,000	16 (40.00)	10 (25.00)	9 (22.50)	35 (29.17)
8,000-10,000	1 (2.50)	2 (5.00)	2 (5.00)	5 (4.17)
8,000 below	4 (10.00)	3 (7.50)	3 (7.50)	10 (8.33)
Retailers				
20-25	3 (7.50)	6 (15.00)	4 (10.00)	13 (10.83)
15-20	5 (12.50)	9 (22.50)	10 (25.00)	24 (20.00)
10-15	4 (10.00)	5 (12.50)	6 (15.00)	15 (12.50)
Tea stallers				
5-10	4 (10.00)	5 (12.50)	5 (12.50)	14 (11.67)
4 below	3 (7.50)	0 (0.00)	1 (2.50)	4 (3.33)
Grand total	40	40	40	120

Figures in parenthesis represent the percent of total respondents in the zone

Brand preference of commercial establishments while purchasing milk powder

Table-14 reveals that highest percentage of sifti was used by north zone 80.00%, followed by central zone 42.50%, then by south 37.50%, with the overall mean of 53.33%. Verka was highest consumed by south zone (60.00%), followed by central zone (32.50%), then by north zone (17.50%) with overall mean of 36.66%. Nestle brand was highest consumed by central zone (25.00%), followed by south zone and north zone (2.5%) with the overall mean of 10.00%.

Table 14: Distribution of respondents in terms of brand preference of consumers as perceived by commercials

Brand	Zones			Pooled
	Central	South	North	
Sifti	17 (42.50)	15 (37.50)	32 (80.00)	64 (53.33)
Verka	13 (32.50)	24 (60.00)	8 (17.50)	44 (36.66)
Nestle	10 (25.00)	1 (2.5)	1 (2.5)	12 (10.00)
Grand total	40	40	40	120

Figures in parenthesis represent the percent of total respondents in the zone.

Seasonal and other influences on purchase of milk powder

It was found from the Table-15 that summer influences on the purchase of milk powder were uniform in all the three zones (2.50%). Winter influences on the purchase of milk powder were mostly seen in south zone (35.00%), followed by central (25.00%), then by north (12.50%), with the overall mean of 21.66%. The influence of marriages on purchase of milk powder was highest in north zone (85.00%), followed by central zone (72.50%), then by south zone (62.50%), with overall mean of 73.33%.

Table 15: Distribution of respondents in terms of seasonal and other influences on purchase of milk powder by consumers as perceived by commercials

Influences	Zones			Pooled
	Central	South	North	
Summer	1 (2.50)	1 (2.50)	1 (2.50)	3 (2.5)
Marriages	29 (72.50)	25 (62.50)	34 (85.00)	88 (73.33)
Winter	10 (25.00)	14 (35.00)	5 (12.50)	29 (21.66)
Grand total	40	40	40	120

Figures in parenthesis represent the percent of total respondents in the zone.

Conclusion

The highest consumption of milk powder was found to be in central and south zone. Most preferred brand among households and commercial establishments was Sifti. Most preferred type of class was skim milk among households and commercial establishments. Tins were most preferred packaging material in case of commercial establishments. Milk powder was mostly utilized as beverages in making tea or coffee. Marriages had a great influence on the purchase of milk powder. The majority of households on an average consumed upto 1 kg of milk powder per month.

Acknowledgements

I would like to extend sincere appreciation to my Advisor and whole staff of Division of LPT, F.V.Sc & A.H. Shuhama, SKUAST-K for accompanying me during my research.

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