RESEARCH PAPER
*Research Journal of Animal Husbandry and Dairy Science* ⇨ e ISSN-2231-6442
Volume 6 | Issue 2 | Dec., 2015 | 115-120 ■ DOI: 10.15740/HAS/RJAHDS/6.2/115-120
Visit us: *www.researchjournal.co.in*

# Studies on physico-chemical changes occurred during storage in *Lassi* prepared from cow milk blended with sapota pulp

K.B. SHINDE, **R.R. SHELKE**, P.A.KAHATE AND K.U. BIDWE

**ABSTRACT :** Present investigation was conducted to study the physico-chemical changes occurred in *Lassi* prepared from cow milk blended with sapota pulp during storage at refrigeration temperature ($7\pm1^0$C). Fresh cow milk was standardized at 3.5 per cent fat and 8.5 per cent SNF then used for the investigation. Five treatments of sapota pulp blended *lassi i. e*. $T_1$, $T_2$, $T_3$, $T_4$ and $T_5$ with different levels of sapota pulp (0, 5, 10, 15 and 20 %) by weight of lassi added during preparation. The physico-chemical analysis was followed to observe the chemical changes occurred in *lassi* during storage and it was observed that moisture, fat and pH was decreased, while total solids, protein and acidity were increased.

**KEY WORDS :** *Lassi*, Sapota pulp, Chemical composition, Fat, Protein, Moisture, Total solid, Solids not fat, pH, Keeping quality

**HOW TO CITE THIS PAPER :** Shinde, K.B., Shelke, R.R., Kahate, P.A. and Bidwe, K.U. (2015). Studies on physico-chemical changes occurred during storage in *Lassi* prepared from cow milk blended with sapota pulp. *Res. J. Animal Hus. & Dairy Sci.,* **6**(2) : 115-120.

## INTRODUCTION

Milk is one of the most affordable sources of many nutrients like proteins and vitamins. Many people do not like to consume milk in its liquid form. Therefore, there are several products which are made from milk called dairy Products, which preserve the nutritive values of milk and makes it easily acceptable to consumers as one of important nutritive and therapeutic valued group is fermented milk products. Milk has been described as most ideal food, which referred as "Bank of Nutrients". The total milk production of India is 135.5 million tonnes, out of which 44.00 per cent is consumed as liquid milk and 56.00 per cent is converted into various milk products (Anonymous, 2014).

*Lassi* is consumed as a cold drink, refreshing therapeutic beverage. It is a popular indigenous fermented milk beverage which is usually prepared by mixing dahi and water in approximately equal parts. *Lassi* is a ready-to-serve, fermented dairy product obtained after the growth of selected culture, usually *Lactic streptococci*, in heat-treated milk followed by breaking up the curd into fine particles by agitation sweetening with sugar and / or fruit additives (Aneja, 1994). It has a creamy consistency, sweetish rich aroma, and a mild to acidic flavour, which makes the product refreshingly palatable.

Sapota (*Achras sapota*) is one of the most important fruits available throughout the year which is great for healthy besides being extremely delicious. The tasty flesh of this fruit is easily digestible and replenishes our body by providing energy due to its high content of

MEMBERS OF RESEARCH FORUM

**Address for correspondence :**
**R.R. Shelke**, Department of Animal Husbandry and Dairy Science, College of Agriculture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, AKOLA (M.S.) INDIA
Email : rrspkv@gmail.com

**Associated Authors' :**
**K.B. Shinde, P.A. Kahate and K.U. Bidwe,** Department of Animal Husbandry and Dairy Science, College of Agriculture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, AKOLA (M.S.) INDIA

digestible sugar, which ranges from 12 to 18 per cent (Shaikh, 2013). As already said, this fruit is rich in vitamins, minerals and tannins. Due its sugary taste, it is widely used in shakes. The various health benefits of sapota are beneficial for the eyes, source of energy, anti-viral and anti-bacterial, aids in weight loss, mental health, prevention of certain cancers, anti-inflammatory agent etc. (Arora, 2006)

The manufacture of indigenous dairy product *lassi* with low-calorie sweeteners could provide an alternate variety to the health conscious consumers. The popularity of this product is not only because of its refreshing and delicious taste, but also due to its nutritive and therapeutic benefits and thirst quenching quality. Considering same values present investigation was planned and undertaken with main objectives to evaluate the physico-chemical changes occurred in *lassi* during storage prepared from cow milk blended with Sapota pulp.

## MATERIAL AND METHODS

The present investigation was undertaken during 2014-2015 in the Department of Animal Husbandry and Dairy Science and Department of Plant Pathology, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra. Fresh cow milk was standardized at 3.5 per cent fat and 8.5 per cent SNF then used for the investigation. The milk was inoculated by adding 0.5-1.0 per cent starter culture consisting of *Streptococcus lactis* sp. diacetylactis. *Lassi* was prepared as procedure prescribed by De (1982). Five treatments of sapota pulp blended *lassi i.e.* $T_1$, $T_2$, $T_3$, $T_4$ and $T_5$ with different levels of sapota pulp (0, 5, 10, 15 and 20 %) by weight of *lassi* added during preparation. The sapota pulp as per treatment, sugar 10 per cent and water 10 per cent was added. The fruit pulp, sugar and water were properly mixed with curd in order to have a homogenous mixture. The prepared fruit pulp *lassi* was packed in 150 ml sterilized plastic cups and stored in refrigerator at $7\pm1^0$C. Observations in respect physico-chemical quality were recorded at 0, 2, 4, 6 and 8 days, respectively.

The *lassi* obtained was analyzed for the physico-chemical properties like, Moisture percentage of *lassi* was calculated by deducting percentage of total solids content from 100 as procedure described in IS: 4079 (1967). Percentage of fat was determined as per the procedure recommended in I.S.I. Hand Book of Food Analysis, Dairy Products, Part 1 (1980). Protein was determined as per method prescribed by Indian Standard Institute in I.S.I. Handbook of Food Analysis, Dairy Products, Part 1 (1981). The percentage of total solids of *lassi* was determined as per formula given by Arora *et al.* (1992). Titratable acidity percentage of *lassi* was determined as per the procedure recommended in BIS Handbook of Food Analysis of Dairy Products in SP: 18 (Part-XI) 1981. The pH of product was determined as per the method of O'Keeffe *et al*. (1976). Data obtained during present investigation were statistically analyzed by adopting Completely Randomised Design (CRD) as described by (Amble, 1975).

## RESULTS AND DISCUSSION

The results of the present study as well as relevant discussions have been presented under following sub heads:

### Chemical changes occurred in *lassi* during storage:

The *lassi* sample of treatments stored at refrigeration temperature showed variation in chemical qualities *viz.*, moisture, fat, protein, total solids, titratable acidity, pH. Observations recorded in respect to chemical quality of *lassi* prepared from cow milk blended with sapota pulp were statistically analyzed, tabulated, presented and discussed as mentioned below.

### Effect on moisture content of *lassi* during storage:

Treatment wise and within treatment changes occurred in *lassi* with respect to moisture percentage during storage was tabulated and presented in Table 1.

Data revealed from Table 1 that, on the day of *lassi* preparation (0 day) moisture percentage was decreased with increase in rate of addition of sapota pulp *i. e.* 87.60, 87.10, 86.38, 85.73 and 85.06 for *lassi* prepared under treatments $T_1$, $T_2$, $T_3$, $T_4$ and $T_5$, respectively. The moisture percentage was gradually decreased from treatment $T_1$ to $T_5$. The highest quantity of moisture percentage was found in treatment $T_1$.

On the 2nd day of storage mean moisture percentage were recorded as 86.04, 85.44, 84.86, 84.21 and 83.68, On the 4th day as 84.84, 84.47, 83.49, 82.85 and 82.31, On the 6th day as 83.26, 83.22, 81.89, 81.29 and 80.79 and On the 8th day of storage mean moisture percentage were recorded as 81.55, 80.93, 80.09, 79.56 and 79.14 for *lassi* prepared under treatments $T_1$, $T_2$, $T_3$, $T_4$ and $T_5$, respectively.

From these observations it was determined that during storage the moisture percentage decreased day

by day. The results obtained in this study in agreement with the results obtained by Kadam *et al.* (2005) who observed that the score for moisture decreased steadily from initial score. Singh *et al.* (2012) and Bagal *et al.* (2007) also recorded decreasing trend of moisture in *lassi* during storage.

**Effect on total solids content of *lassi* during storage:**

Treatment wise and within treatment changes occurred in *lassi* with respect to total solids percentage during storage was tabulated and presented in Table 2.

Data revealed from Table 2 that, on the day of *lassi* preparation (0 day) total solids percentage was increased with increase in rate of addition of sapota pulp *i. e.* 12.40, 12.90, 13.62, 14.27 and 14.94 for *lassi* prepared under treatments $T_1$, $T_2$, $T_3$, $T_4$ and $T_5$, respectively. The total solids percentage was gradually increased from treatment $T_1$ to $T_5$. The highest quantity of total solids percentage was found in treatment $T_5$.

On the 2nd day of storage mean total solids percentage were recorded as 13.96, 14.56, 15.14, 15.80 and 16.32, On the 4th day as 15.16, 15.53, 16.51, 17.15 and 17.69, On the 6th day as 16.74, 16.78, 18.11, 18.72 and 19.21 and On the 8th day of storage mean total solids percentage were recorded as 18.45, 19.07, 19.91, 20.44 and 20.86 for *lassi* prepared under treatments $T_1$, $T_2$, $T_3$, $T_4$ and $T_5$, respectively.

From these observations it was determined that during storage the total solids percentage increased day by day. The results obtained in this study are in agreement with the results obtained by Bagal *et al.* (2007); Shuwu *et al.* (2011) and Jadhav *et al.* (2014) who observed that the total solids percentage was increased during storage as compared to initial total solids percentage.

**Effect on fat percentage of *lassi* during storage :**

Treatment wise and within treatment changes occurred in *lassi* with respect to fat percentage during storage was tabulated and presented in Table 3.

Data revealed from Table 3 that, on the day of *lassi* preparation (0 day) fat percentage was decreased with increase in rate of addition of sapota pulp *i. e.* 2.91, 2.80, 2.70, 2.62 and 2.49 for *lassi* prepared under treatments $T_1$, $T_2$, $T_3$, $T_4$ and $T_5$, respectively. The fat percentage

**Table 1 : Effect on moisture per cent of *lassi* prepared from cow milk blended with sapota pulp during storage under refrigeration condition (7±1$^0$C)**

| Treatments | Observations recorded during storage (at day) Mean of 4 replications | | | | |
|---|---|---|---|---|---|
| | 0 | 2 | 4 | 6 | 8 |
| $T_1$ | 87.60 | 86.04 | 84.84 | 83.26 | 81.55 |
| $T_2$ | 87.10 | 85.44 | 84.47 | 83.22 | 80.93 |
| $T_3$ | 86.38 | 84.86 | 83.49 | 81.89 | 80.09 |
| $T_4$ | 85.73 | 84.21 | 82.85 | 81.29 | 79.56 |
| $T_5$ | 85.06 | 83.68 | 82.31 | 80.79 | 79.14 |
| 'F' test | Sig. | Sig | Sig. | Sig. | Sig. |
| S.E. ± | 0.04 | 0.06 | 0.10 | 0.15 | 0.15 |
| C.D. (P=0.05) | 0.14 | 0.19 | 0.32 | 0.48 | 0.45 |

**Table 2 : Effect on total solids per cent of *lassi* prepared from cow milk blended with sapota pulp during storage under refrigeration condition (7±1$^0$C)**

| Treatments | Observations recorded during storage (at day) Mean of 4 replications | | | | |
|---|---|---|---|---|---|
| | 0 | 2 | 4 | 6 | 8 |
| $T_1$ | 12.40 | 13.96 | 15.16 | 16.74 | 18.45 |
| $T_2$ | 12.90 | 14.56 | 15.53 | 16.78 | 19.07 |
| $T_3$ | 13.62 | 15.14 | 16.51 | 18.11 | 19.91 |
| $T_4$ | 14.27 | 15.80 | 17.15 | 18.71 | 20.44 |
| $T_5$ | 14.94 | 16.32 | 17.69 | 19.21 | 20.86 |
| 'F' test | Sig. | Sig. | Sig. | Sig. | Sig. |
| S.E. ± | 0.01 | 0.06 | 0.10 | 0.15 | 0.15 |
| C.D. (P=0.05) | 0.04 | 0.19 | 0.32 | 0.48 | 0.48 |

was gradually decreased from treatment $T_1$ to $T_5$. The highest quantity of fat percentage was found in treatment $T_1$.

On the 2nd day of storage mean fat percentage were recorded as 2.87, 2.77, 2.65, 2.57 and 2.45, On the 4th day as 2.84, 2.72, 2.62, 2.54 and 2.41, On the 6th day as 2.81, 2.69, 2.58, 2.50 and 2.38 and On the 8th day of storage mean fat percentage was recorded as 2.77, 2.65, 2.55, 2.47 and 2.35 for *lassi* prepared under treatments $T_1$, $T_2$, $T_3$, $T_4$ and $T_5$, respectively. From these observations it was determined that during storage the fat percentage decreased day by day. The results obtained in this study in agreement with the results obtained by Avtade *et al.* (2010); Shuwu *et al.* (2011); Pardhi *et al.* (2012) and Jadhav *et al.* (2014) who observed that the fat percentage was decreased during storage as compared to initial fat percentage.

**Effect on protein percentage of *lassi* during storage:**

Treatment wise and within treatment changes occurred in *lassi* with respect to protein percentage during storage was tabulated and presented in Table 4.

Data revealed from Table 4 that, on the day of *lassi* preparation (0 day) protein percentage was decreased with increase in rate of addition of sapota pulp *i. e.* 2.30, 2.21, 2.14, 2.06 and 1.97 for *lassi* prepared under treatments $T_1$, $T_2$, $T_3$, $T_4$ and $T_5$, respectively. The protein percentage was gradually decreased from treatment $T_1$ to $T_5$. The highest quantity of protein percentage was found in treatment $T_1$.

On the 2nd day of storage mean protein percentage were recorded as 2.42, 2.33, 2.26, 2.19 and 2.09, On the 4th day as 2.55, 2.46, 2.32, 2.24 and 2.20, On the 6th day as 2.72, 2.63, 2.49, 2.41 and 2.38 and On the 8th day of storage mean protein percentage were recorded as 2.91, 2.82, 2.71, 2.60 and 2.58 for *lassi* prepared under treatments $T_1$, $T_2$, $T_3$, $T_4$ and $T_5$, respectively. From these observations it was determined that during storage the protein percentage decreased day by day. The results obtained in this study in agreement with the results obtained by Avtade *et al.* (2010); Shuwu *et al.* (2011) and Jadhav *et al.* (2014) who observed that the protein percentage was increased.

**Table 3 : Effect on fat per cent of *lassi* prepared from cow milk blended with sapota pulp during storage under refrigeration condition (7±1$^0$C)**

| Treatments | Observations recorded during storage (at day) Mean of 4 replications | | | | |
|---|---|---|---|---|---|
| | 0 | 2 | 4 | 6 | 8 |
| $T_1$ | 2.91 | 2.87 | 2.84 | 2.81 | 2.77 |
| $T_2$ | 2.80 | 2.77 | 2.72 | 2.69 | 2.65 |
| $T_3$ | 2.70 | 2.65 | 2.62 | 2.58 | 2.55 |
| $T_4$ | 2.62 | 2.57 | 2.54 | 2.50 | 2.47 |
| $T_5$ | 2.49 | 2.45 | 2.41 | 2.38 | 2.35 |
| 'F' test | Sig. | Sig. | Sig | Sig. | Sig. |
| S.E. ± | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| C.D. (P=0.05) | 0.03 | 0.03 | 0.03 | 0.03 | 0.02 |

**Table 4 : Effect on protein per cent of *lassi* prepared from cow milk blended with sapota pulp during storage under refrigeration condition (7±1$^0$C)**

| Treatments | Observations recorded during storage (at day) Mean of 4 replications | | | | |
|---|---|---|---|---|---|
| | 0 | 2 | 4 | 6 | 8 |
| $T_1$ | 2.30 | 2.42 | 2.55 | 2.72 | 2.91 |
| $T_2$ | 2.21 | 2.33 | 2.46 | 2.63 | 2.82 |
| $T_3$ | 2.14 | 2.26 | 2.32 | 2.49 | 2.71 |
| $T_4$ | 2.06 | 2.19 | 2.24 | 2.41 | 2.60 |
| $T_5$ | 1.97 | 2.09 | 2.20 | 2.38 | 2.58 |
| 'F' test | Sig. | Sig. | Sig. | Sig. | Sig |
| S.E. ± | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| C.D. (P=0.05) | 0.02 | 0.03 | 0.04 | 0.03 | 0.02 |

**Effect on titratable acidity of *lassi* during storage:**

Treatment wise and within treatment changes occurred in *lassi* with respect to titratable acidity percentage during storage was tabulated and presented in Table 5.

Data revealed from Table 5 that, on the day of *lassi* preparation (0 day) titratable acidity percentage was decreased with increase in rate of addition of sapota pulp *i. e.* 0.76, 0.73, 0.70, 0.68 and 0.65 for *lassi* prepared under treatments $T_1$, $T_2$, $T_3$, $T_4$ and $T_5$, respectively. The titratable acidity percentage was gradually decreased from treatment $T_1$ to $T_5$. The highest quantity of titratable acidity percentage was found in treatment $T_1$.

On the 2nd day of storage mean titratable acidity percentage were recorded as 0.78, 0.75, 0.73, 0.71 and 0.68, On the 4th day as 0.81, 0.78, 0.75, 0.74 and 0.71, On the 6th day as 0.87, 0.84, 0.81, 0.79 and 0.78 and On the 8th day of storage mean titratable acidity percentage were recorded as 0.96, 0.94, 0.93, 0.92 and 0.91 for *lassi* prepared under treatments $T_1$, $T_2$, $T_3$, $T_4$ and $T_5$, respectively. On the 8th day of *lassi* samples were rejected as observing the increased acidity level of *lassi*. From these observations it was determined that during storage the titratable acidity percentage increased day by day. The *lassi* was acceptable up to 6th day of preparation. The results obtained in this study are in agreement with the results obtained by Kumar and Rathur (2000), Kadam *et al.* (2005), Kadam *et al.* (2006) and Shuwu *et al.* (2011)who observed that the titratable acidity percentage was increased during storage as compared to initial titratable acidity percentage.

**Effect on pH of *lassi* during storage :**

Treatment wise and with in treatment changes occurred in *lassi* with respect to pH during storage was tabulated and presented in Table 6.

Data revealed from Table 6 that, on the day of *lassi* preparation (0 day) pH was increased with increase in rate of addition of sapota pulp *i. e.* 4.04, 4.08, 4.12, 4.15 and 4.18 for *lassi* prepared under treatments $T_1$, $T_2$, $T_3$, $T_4$ and $T_5$, respectively. The pH was gradually increased from treatment $T_1$ to $T_5$. The highest quantity of pH was found in treatment $T_5$.

On the 2nd day of storage mean pH were recorded as 4.02, 4.06, 4.09, 4.12 and 4.15, On the 4th day as 3.99, 4.01, 4.05, 4.09 and 4.11, On the 6th day as 3.96, 3.98,

**Table 5 : Effect on titratable acidity per cent of *lassi* prepared from cow milk blended with sapota pulp during storage under refrigeration condition (7±1$^0$C)**

| Treatments | Observations recorded during storage (at day) Mean of 4 replications | | | | |
|---|---|---|---|---|---|
| | 0 | 2 | 4 | 6 | 8 |
| $T_1$ | 0.76 | 0.78 | 0.81 | 0.87 | 0.96 |
| $T_2$ | 0.73 | 0.75 | 0.78 | 0.84 | 0.94 |
| $T_3$ | 0.70 | 0.73 | 0.75 | 0.81 | 0.93 |
| $T_4$ | 0.68 | 0.71 | 0.74 | 0.79 | 0.92 |
| $T_5$ | 0.65 | 0.68 | 0.71 | 0.78 | 0.91 |
| 'F' test | Sig. | Sig. | Sig. | Sig. | Sig. |
| S.E. ± | 0.003 | 0.005 | 0.005 | 0.003 | 0.002 |
| C.D. (P=0.05) | 0.011 | 0.015 | 0.017 | 0.010 | 0.007 |

**Table 6 : Effect on pH of *lassi* prepared from cow milk blended with sapota pulp during storage under refrigeration condition (7±1$^0$C)**

| Treatments | Observations recorded during storage (at day) Mean of 4 replications | | | | |
|---|---|---|---|---|---|
| | 0 | 2 | 4 | 6 | 8 |
| $T_1$ | 4.04 | 4.02 | 3.99 | 3.96 | 3.93 |
| $T_2$ | 4.08 | 4.06 | 4.01 | 3.98 | 3.95 |
| $T_3$ | 4.12 | 4.09 | 4.05 | 4.01 | 3.98 |
| $T_4$ | 4.15 | 4.12 | 4.09 | 4.06 | 4.01 |
| $T_5$ | 4.18 | 4.15 | 4.11 | 4.08 | 4.03 |
| 'F' test | Sig. | Sig | Sig. | Sig. | Sig. |
| S.E. ± | 0.005 | 0.005 | 0.004 | 0.004 | 0.003 |
| C.D. (P=0.05) | 0.017 | 0.016 | 0.011 | 0.012 | 0.010 |

4.01, 4.06 and 4.08 and on the 8th day of storage mean pH were recorded as 3.93, 3.95, 3.98, 4.01 and 4.03 for *lassi* prepared under treatments $T_1$, $T_2$, $T_3$, $T_4$ and $T_5$, respectively. From these observations it was determined that during storage the pH was decreased day by day.

The results obtained in this study are in agreement with the results obtained by Shuwu *et al.* (2011) and Deshmukh *et al.* (2013) who observed that the pH was decreased during storage as compared to initial pH.

**Conclusion:**

From the data obtained during present investigation on storage of *lassi* prepared from blending of sapota pulp it was observed that moisture, fat and pH was decreased while total solids, protein, and acidity increased.

## LITERATURE CITED


Aneja, R.P. (1994). Modernization of traditional Indian dairy sector. Indian Dairyman, 1994 Cited, Dairy India, 1997 : 391.

Anonymous (2014). Indian Dairyman. 2013:1-2.

Amble, V. N. (1975). *Statistical methods in animal science*. Indian Society Agricultural Statistics, New Delhi. (1st Ed.) :199-219.

Arora, B. (2006). Health related properties of fermented milk products – A review. *Indian J. Dairy Sci*., **59** (2): 57 - 63.

Arora, K.L., Gupta, V.K. and Rajorhia, Q.S. (1992). Standardization of a method for total solids determination in flavoured milk and sweetened fermented milk drink (*Lassi*) using B.I.S. Lactometer. *J. Dairying, Food & Home Sci.,* **11**(2): 106.

Avtade, N.B., Wankhede, S.A. and Chaudhary, D.M. (2010). Effect of pomegranate juice on chemical quality of *lassi*. N. B. *Mysore J. Agric, Set.,* **44** (1): 209-212.

Bagal, S.G., Chavan, K.D. and Kulkarni, M.B. (2007). Studies on preparation of *lassi* from high acid cow milk. *J. Dairying, Foods & Home Sci.,* **26** (2) : 80-84.

De Sukumar (2013). *Outline of dairy technology*. Oxford University Press. New Delhi, India.

Deshmukh, A.M., Zagare, M.S. and Patil, S.S. (2013). Effect of pH on microbial quality of dairy pack food. *An Internat. per Revised J.,* **2**(4): 1-4

IS: 4079 (1967). Method of test for Dairy Industry. Indian Standard Institution Manak Bhavan, New Delhi, India.

I.S.I. (1980). *Indian Standards Hand Book of Food Analysis.* SP; 18 (Part-I) General Methods, Indian Standards Institution, Manak Bhavan, 9, Bahadur Shah Zafar Marg, New Delhi.

ISI (1981). *Handbook of food analysis, Dairy products,* SP: 18 (Part-XI) Bureau of Indian Standards, Manek bhavan, New Delhi, India

Jadhav, D.S., Chavan, K.D. and Desale, R.J. (2014). Influence of addition of orange (Citrus Sinesis) juice on sensory and microbial qualities of *lassi* during storage. *Asian J. Dairy & Food Res.,* **33** (3) : 187-189.

Kadam, P.S., Kalepatil, R.K., Avhad, V.B., Sharma, S.K. and Motey, R.H. (2006). Some studies on preparation of *lassi* concentrate. *J. Soils & Crops,* **16** (1) : 121-126.

Kadam, P. S., Kedare, S.D., Ghatge, P.U. and Ingole, J. (2005). Studies on preparation of soymilk blended *lassi*. *J. Soils & Crops,* **15** (2) : 366-369.

Kumar, A. and Rathur M.J. (2000). Storage related sensory changes in *lassi*. *Dairying. Foods & Home Sci.,* **19** (2): 100-104.

O'keeffe, R.B., Fox, P.F. and Daly, C. (1976). Contribution of rennet and starter proteases to proteolysis in cheddar cheese. *J. Dairy Res.,* **43** : 97-107.

Shaikh, F.K. (2013). Utilization of Sapota pulp in preparation of *Lassi* M.Sc.(Ag.) Thesis, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, M.S. (INDIA).

Shuwu, M.P., Ranganna, B., Suresha, K.B. and Veena, R. (2011). Development of value added lassi using honey. *Mysore J. Agric. Sci.,* **45** (4): 757-763.

Singh, T.P., Kumari, S. and Sethi, S. (2012). Development of *lassi* containing aloe vera juice and its quality characteristics. *J. Dairying, Foods & Home Sci.,* **31** (1): 1 – 4.


***Received :*** *14.10.2015;* ***Revised:*** *28.10.2015;* ***Accepted :*** *14.11.2015*