RESEARCH ARTICLE

KNOWLEDGE AND ADOPTION LEVEL OF VALUE ADDED TECHNIQUES AMONG POTATO GROWERS OF ANAND AND KKHEDA DISTRICT OF GUJARAT STATE

Nidhi Tikariha*[1], N.V. Soni[2]

[1]*Department of Agricultural Extension, B. A. College of Agriculture, Anand Agricultural University, Anand, Gujarat - 388110*
[2]*Directorate of Extension Education, Anand Agricultural University, Anand, Gujarat*
Email: nidhu4792@gmail.com

Received-03.07.2018, Revised-23.07.2018

Abstract: The present study was undertaken in Anand and Kheda district of Gujarat state. This study was conducted in 12 purposively selected villages of four purposively selected talukas i.e. Anand and Umreth of Anand district and Nadiad and Kapadwanj taluka of Kheda district. A total of 120 potato growers having experience more than 5 years were selected randomly. Aim of the study was to ascertain knowledge and adoption level of value added techniques among potato growers. The data were collected through personal interview using interview schedule. Half (50.00 per cent) of the respondents had low level of knowledge, followed by 38.33 per cent had medium level , 6.66 per cent had high level and 5 per cent had very high knowledge level of value added techniques of potato. According to knowledge of potato growers, value added techniques were ranked in following manner; a variety of potato suitable for processing (Rank I), an international variety of potato introduced to Gujarat for processing high quality of french-fries (Rank I), APMC as agency for marketing agricultural produce (Rank I), correct temperature for storing potato (Rank II), chemical useful for sprout inhibition (Rank III). Great majority (91.66 per cent) of respondents had very low adoption level, followed by 8.33 per cent had low level of adoption level. According to adoption level of potato growers, value added techniques were ranked as, packing of potatoes (Rank I), sorting of potatoes using cold storage (Rank II), grading of potatoes (Rank III), Value added technique fully adopted by majority of the respondents were selling potatoes to other districts (78.33 per cent); partially adopted by majority of the respondents was curing after harvesting (21.67 per cent); not adopted by majority of the respondents was, use of colour card for identifying colour of potato chips (100.00 per cent), Packaging of value added products before selling (100.00 per cent), buying and selling potato or potato products online (100.00 per cent) selling potatoes to other states (100.00 per cent).

Keywords : Knowledge, Adoption, Value-added techniques

INTRODUCTION

With globalization, economic liberalization concomitant with growing urbanization consumer preferences is changing. To address this situation, the emphasis is on enabling farmers to increase their level of competitiveness, to produce for an identified market and seeking new market opportunities that offer higher levels of income. This poses new opportunities but also challenges to small-scale producers, traders and processors. Therefore, producing a quality product is of great importance.

Value addition, that is, enhancement added to a product or service at every step of its production, till the product is offered to customers is the need of an hour. This will in turn be profitable both for producers as well as consumers. The value chain runs from production to procurement, storage, wholesale, retail sale, packaging, distribution and processing.

Accounting for about 32 per cent of the country's total food market, the food processing industry is ranked fifth in terms of production, consumption, export and expected growth, according to data released by the Agricultural and Processed Food Products Export Development Authority. (India Brand Equity Foundation, 2017). A new Scheme ‘‘Operation Greens’’ was announced to address the challenge of price volatility of perishable commodities like tomato, onion and potato with the satisfaction of both the farmers and consumers. (PIB, February 2018)

Potatoes are increasingly being figured as an important cash crop. Being the king of vegetables, important factors responsible for having a wide scope in a growth of potato related enterprise are availability of indigenous potato varieties useful for processing and wide agro-ecological conditions for growing these varieties for an adequate and round-the-year supply of raw material to the processing industry. Not only that potatoes are suitable for diversified processed products like chips, french fries, cubes, granules and canned products as compared to other major food crops/cereals, but also that these products offer great market opportunities in India and abroad. India today stands in a comfortable position not only to sustain potato production and diversify its utilization, but also to augment the expanding potato based processing industries.

Potato is one of the major vegetables grown in Gujarat. It is the fifth largest potato producing State and accounts for 5.0 per cent of total production of potato in the country. The state produces about 22.7 lakh MT of potato with a productivity of 30.8 t/ha

*Corresponding Author

which is the highest in the country (Anonymous, 2015). In 2017, Gujarat's Banaskantha district has mashed Agra (UP) in potato production, taking the No. 1 rank in India. (Kaushik, 2017)

Gujarat Agro vision 2010 envisaged that the new trend for improving the quality of life of the rural population will be towards value addition and demand based agriculture through agro processing and agro marketing in the context of liberalization and globalization. Exports of agricultural products will be encouraged in the form of value added products.

Keeping in view the significant consequence of knowledge and adoption level of value added techniques, to reap benefits to potato growers in prevailing competitive environment, the study was undertaken with following objective "To ascertain knowledge and adoption level of value added techniques among potato growers of Anand and Kheda district of Gujarat state".

METHODOLOGY

Four talukas i.e, Anand and Umreth talukas of Anand district and Nadiad and Kapadwanj talukas of Kheda district had been selected purposively. A random sample of 120 potato growers were selected from 12 villages (i.e, 3 villages from each taluka) because these talukas had more area under potato cultivation in middle Gujarat and there was viable scope to serve the potato growers by informing them about new technology developed by the scientists and also communicating problems and suggestions notified by the farmers to the extension functionaries during study.

An index was developed to measure the knowledge and adoption of value added techniques of potato growers. Knowledge was measured with the help of teacher made test developed for the purpose. The questions included in the test were of multiple choice type in nature. Each question was given the score of one for correct answer and zero for incorrect answer. Response of the final score was worked out by summing scores obtained by respondent for all statements. Using this score, knowledge index was calculated.

Knowledge index = (Obtained score/ Total score) * 100

Adoption of the potato growers regarding value added techniques of potato was measured with the help of teacher made test developed for the purpose. The responses were obtained against each statement in terms of their degree of adoption on a three point continuum namely full adoption, partial adoption and no adoption and score of 2, 1 and 0 were given, respectively. Response of the final score was worked out by summing scores obtained by respondent for all statements.

The data were collected through personal interview and then after it was compiled, tabulated and analyzed to get proper answer for the specific objectives with the help of appropriate statistical tools such as percentage, mean, frequency and correlation coefficient to test the hypothesis under study. The Ex-post-facto research design has been used in present investigation. The interview schedule in gujarati language was used as a tool for collection of requisite information.

RESULTS

Knowledge about value added technique

According to knowledge of potato growers, value added techniques were ranked in following manner; a variety of potato suitable for processing (Rank I), an international variety of potato introduced to Gujarat for processing high quality of french fries (Rank I), APMC as agency for marketing agricultural produce (Rank I), correct temperature for storing potato (Rank II), chemical useful for sprout inhibition (Rank III), French fries is one of the way for value addition in potatoes (Rank IV), poison found in green coloured potato (Rank V), packaging material used for potato chips (Rank VI), an organization involved in export of agricultural and processed products (Rank VII), method for increasing the productivity of potato (Rank VIII), useful technique for preventing the degradation of potato tuber (Rank IX), latest method for identifying colour of chips (Rank X), method for increasing the productivity of potato (XI), useful technique for preventing the degradation of potato tuber(Rank XII), latest method for identifying colour of chips (XIII), respectively as shown in table 1.

Half (50.00 per cent) of the respondents had low level of knowledge, followed by 38.33 per cent had medium level , 6.66 per cent had high level and 5 per cent had very high knowledge level of value added techniques. None of the potato growers fell under the category of very low knowledge level as shown in table 2.

Table 1. Distribution of the potato growers according to their frequency of knowledge about each value added techniques **n= 120**

Sr. No.	Knowledge of value added techniques	Frequency	Per cent	Rank
1	A variety of potato suitable for processing.	120	100.00	I

2	An international variety of potato introduced to Gujarat for processing high quality of french fries.	120	100.00	I
3	Method for increasing the productivity of potato.	4	03.34	XI
4	Best practice for raising the healthy seed crop.	22	118.34	IX
5	Chemical useful for sprout inhibition.	61	50.84	V
6	Useful technique for preventing the degradation of potato tuber.	00	0.00	XII
7	Poison found in green coloured potato.	48	40.00	VII
8	Method used for separating diseased and cut tubers.	120	100.00	I
9	Technique used for separating different sized potatoes.	118	98.34	II
10	Technology used for increasing the shelf life of potato.	120	100.00	I
11	Production of chips as value added product of potato.	120	100.00	I
12	Correct temperature for storing potato.	71	59.17	IV
13	APMC as agency for marketing agricultural produce.	105	87.50	III
14	French fries is one of the way for value addition in potatoes.	51	42.50	VI
15	Packaging material used for potato chips.	42	35.00	VIII
16	Latest method for identifying colour of chips.	00	0.00	XIII
17	An organization involved in export of agricultural and processed products.	12	110.00	X

Table 2. Distribution of the respondents according to their knowledge level of value added techniques

n=120

Sr. No.	Category	Frequency	Per cent
1	Very low (Up to 20 % of total score)	0	0
2	Low (Above 20% to 40 % of total score)	61	50.00
3	Medium (Above 40% to 60 % of total score)	45	38.33
4	High (Above 60% to 80 % of total score)	08	06.67
5	Very high (Above 80% to 100% of total score)	06	05.00
Total		120	100.00

Adoption of value added techniques

Value added techniques fully adopted by majority of the respondents were Growing variety suitable for processing (30.83 per cent), seed treatment before sowing (69.17 per cent), use sprout inhibition technique (54.17 per cent) and sell potatoes to other districts (78.33 per cent), respectively.

Value added techniques partially adopted by majority of the respondents were Growing variety suitable for processing (20.83 per cent), seed treatment before sowing (17.50 per cent), use sprout inhibition technique (20.83 per cent), curing after harvesting (21.67 per cdent) and sorting of potatoes (18.33 per cent), respectively.

Value added techniques not adopted by majority of the respondents were Growing international varieties introduced to Gujarat for processing (95.83 per cent), use seed plot technique (98.33 per cent), using cold storage (98.33 per cent), store seeds of potatoes (97.50 per cent), manufacture value added products

(93.33 per cent), use colour card for identifying colour of potato chips (100.00 per cent), Packaging of value added products before selling (100.00 per cent), Buy and sell potato or potato products online (100.00 per cent) sell potatoes to other states (100.00 per cent), respectively (as shown in table 3).

According to adoption level of potato growers, value added techniques were ranked as, packing of potatoes (Rank I),sorting of potatoes using cold storage (Rank II), grading of potatoes (Rank III), grow international varieties introduced to gujarat for processing (Rank IV), store seed of potatoes(Rank V), seed treatment before sowing (Rank VI) grow variety suitable for processing (Rank VII), sell potatoes to other districts (Rank VIII), use sprout inhibition technique(Rank IX), curing after harvesting packaging of value added products before selling (Rank X), packaging of value added products before selling buy and sell, potato or potato products online(Rank XI) export potatoes (Rank XII), use seed plot technique use seed plot technique(Rank XIII), manufacture value added products (Rank XIV) use colour card for identifying colour of potato chips sell potatoes to other states (Rank XV), Manufacture value added products (Rank XVI), Use colour card for identifying colour of potato chips (Rank XVII), Sell potatoes to other states (Rank XVIII) (as shown in table 4 and fig. 1)

Great majority (91.66 per cent) of the respondents had very low adoption level, followed by 8.33 per cent had low level of adoption level. None of the potato growers fell under the category of medium, high and very high adoption level of value added techniques (as shown in table 5).

Table 3. Distribution of potato growers according to adoption of each value added technique of potato

n=120

Sr. no.	Technology	Fully adopted		Partially adopted		No adoption	
		Frequency	%	Frequency	%	Frequency	%
1.	Grow variety suitable for processing	37	30.83	25	20.83	58	48.33
2	Grow international varieties introduced to Gujarat for processing	0	0.00	5	4.17	115	95.83
3	Use seed plot technique	2	1.67	0	0.00	118	98.33
4	Seed treatment before sowing	83	69.17	21	17.50	16	13.33
5.	Use sprout inhibition technique	65	54.17	25	20.83	30	25.00
6	Curing after harvesting	4	3.33	26	21.67	90	75.00
7	Sorting of potatoes	14	11.67	22	18.33	84	70.00
8	Grading of potatoes	4	3.33	14	11.67	102	85.00
9	Packing of potatoes	2	1.67	13	10.83	105	87.50
10	Using cold storage	0	0.00	2	1.67	118	98.33
11	Store seed of potatoes	1	0.83	2	1.67	117	97.50
12	Manufacture value added products	2	1.67	6	5.00	112	93.33
13.	Use colour card for identifying colour of potato chips	0	0.00	0	0.00	120	100.00
14	Packaging of value added products before selling	0	0.00	0	0.00	120	100.00
15	Buy and sell potato or potato products online	0	0.00	0	0.00	120	100.00
16	Sell potatoes to other districts	94	78.33	17	14.17	9	7.50
17	Sell potatoes to other states	2	1.67	0	0.00	118	98.33
18	Export potatoes	2	1.67	0	0.00	118	98.33

Table 4. Adoption of value added techniques of potato according to mean score. **n=120**

Sr. No.	Adoption of value added techniques	Total score	Mean score	Rank
1	Packing of potatoes	205	1.708	I
2	Sorting of potatoes	187	1.558	II

3	Using cold storage	155	1.291	III
4	Grading of potatoes	99	0.825	IV
5	Grow international varieties introduced to Gujarat for processing	50	0.416	V
6	Store seed of potatoes	32	0.266	VI
7	Seed treatment before sowing	22	0.184	VII
8	Grow variety suitable for processing	17	0.141	VIII
9	Sell potatoes to other districts	10	0.083	IX
10	Use sprout inhibition technique	5	0.041	X
11	Curing after harvesting	4	0.041	XI
12	Packaging of value added products before selling	4	0.033	XII
13	Buy and sell potato or potato products online	4	0.033	XIII
14	Export potatoes	4	0.033	XIV
15	Use seed plot technique	2	0.016	XV
16	Manufacture value added products	0	00.00	XVI
17	Use colour card for identifying colour of potato chips	0	00.00	XVII
18	Sell potatoes to other states	0	00.00	XVIII

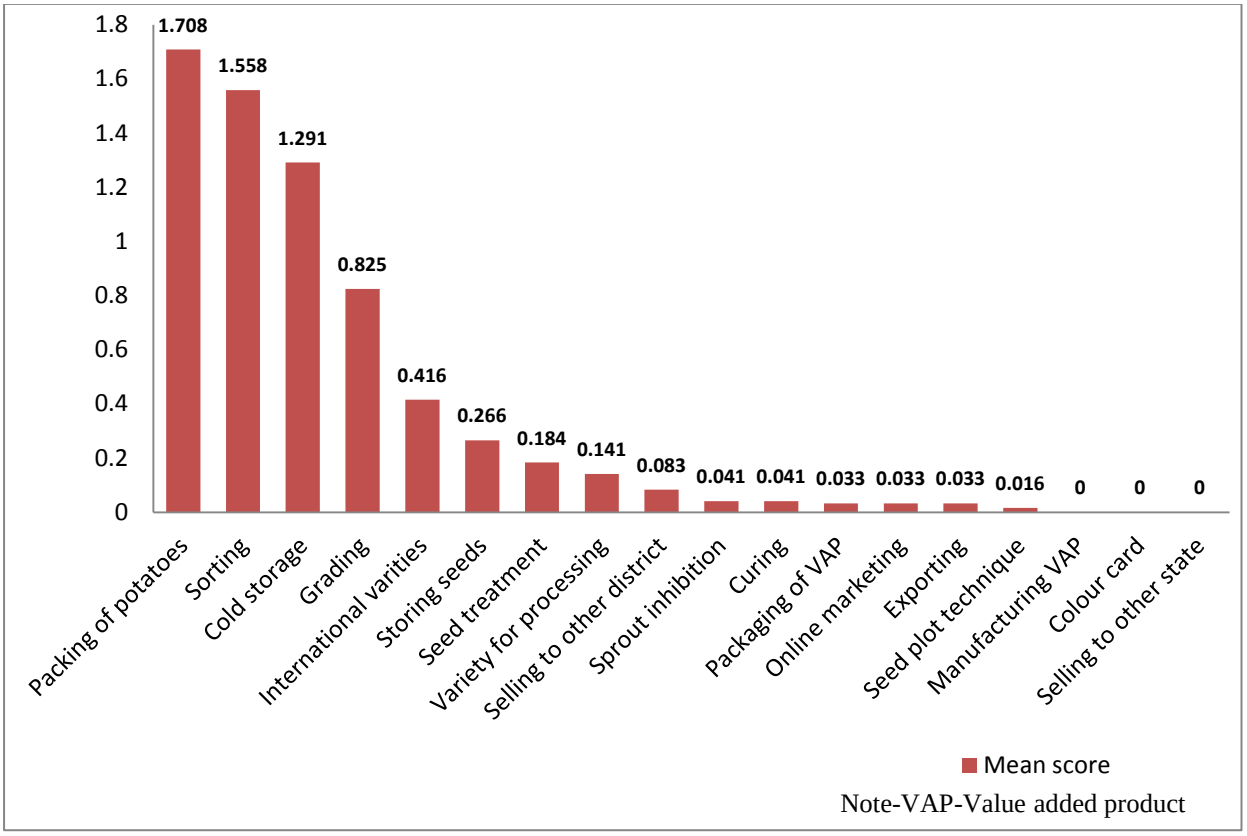

Figure 1. Adoption of value added techniques of potato by potato growers

Table 5. Distribution of the respondents according to their adoption level of value added techniques of potato

n=120

Sr. No.	Category	Frequency	Per cent
1	Very low (Up to 20 % of total score)	110	91.66
2	Low (21 to 40 % of total score)	10	08.33
3	Medium (41 to 60 % of total score)	0	0
4	High (61 to 80 % of total score)	0	00
5	Very high (Above 80 % of total score)	0	00
Total		120	100.00

CONCLUSION

The data from the Table 2 indicate that half (50.00 per cent) of the respondents had low level of knowledge, followed by 38.33 per cent had medium level , 6.66 per cent had high level and 5 per cent had very high knowledge level of value added techniques. None of the potato growers fell under the category of very low knowledge level

The table also shows that half (50.00 per cent) of the respondents had medium to very high level of knowledge about value added techniques.

The probable reason might be that farmers might be unenthusiastic towards innovative technologies related to value addition of raw produce. They had vast experience of potato cultivation only, they are more comfortable in performing potato cultivation practices. Instead of the fact that potato is an important commercial vegetable grown in the study area, no training or awareness programme, specifically related to value addition of the potato have been conducted. All these factors have higher accountability towards low knowledge level of value added techniques of potato.

The data from the Table 5 indicate that great majority (91.66 per cent) of the respondents had very low adoption level, followed by 8.33 per cent had low level of adoption level. None of the potato growers fell under the category of medium, high and very high adoption level of value added techniques.Table also shows that cent per cent of the potato growers were in very low to low adoption level of value added techniques

The probable reason might be that, due to participants' socio-economic condition, local people were busy to fulfill their household income and food self-sufficiency. They might have reluctance towards innovation and a little interest and knowledge on issues related to value added techniques. Furthermore, it was realized that the impact of agricultural commercialization and mechanization might not have affected the people of the study areas in a balanced way.

Present level of knowledge and adoption level can be utilized to employ appropriate technique to harness the emerging opportunities for enhancing knowledge for greater adoption of innovative techniques and developing the capacity of farmers so that they can be adapted to prevailing competitive environment in order to gain more profit from their potato enterprise.

REFERENCES

Aniedu, C., Aniedu, O. C. and Nwakor, N. (2012). Impact & Adoption of Value Added Innovations in Root & Tuber Crops Among Farmers in Imo State, Nigeria. *Global Journal of Science Frontier Research Agriculture & Veterinary Sciences*, 12 (11), 1-6.

Anonymous (2015). State wise Horticulture Status. - National Horticulture Mission Retrieved from *nhm.nic.in/Archive/Statewise-Horticulture-Status.do.*

Chaudhary, D. and Chauhan,, N.M. (2016). Knowledge & Adoption of Biofertilizer Users. *Gujarat Journal of Extension Education*, 27(2),176-179.

India Brand Equity Foundation (2017). *Indian Food Processing* (Sectoral report). India. Retrieved from https://www.ibef.org/industry/indian-food-industry.aspx

Kaguongo, W., Ortmann, G., Wale, E., Darroch, M. and Low, J. (2012). Factors Influencing Adoption & Intensity of Adoption of Orange Flesh Sweet Potato Varieties: Evidence from an Extension Intervention in Nyanza & Western Provinces, Kenya. *African Journal of Agricultural Research*, 7(3), 493-503.

Kaushik, H. (2017). Gujarat now alpha aloo state. *The Times of India.*

Press Information Bureau (2018). Summary of Budget 2018-19. Ministry of Finance, Government of India. Retrieved from http://pib.nic.in/newsite/PrintRelease.aspx?relid=176062

Soni, D. N., Soni, A. N. and Timbadia, C. K. (2016). Impact Of Training On Knowledge Level Of Participants Regarding Value Addition In Papaya. *Gujarat Journal of Extension Education*, 27(2), 126-129.