

# Economics of Value Added Products of Maize in Chhattisgarh

Sumit Karmakar<sup>\*1</sup> and A.K. Gouraha<sup>2</sup>

<sup>1</sup>Department of Agricultural Economics, College of Agriculture, Indira Gandhi Krishi Vishwavidyalaya Raipur, Chhattisgarh, India

<sup>2</sup>Department of Agribusiness and Rural Management, College of Agriculture, Indira Gandhi Krishi Vishwavidyalaya Raipur, Chhattisgarh, India

Corresponding author: sumitkarmakar67@gmail.com (ORCID ID: 0000-0002-2332-5954)

Paper No. 755

Received: 06-07-2018

Accepted: 21-11-2018

## ABSTRACT

This research study was mainly done on the process of various types of value-added products prepared from maize and the cost and return of value-added products made from maize by street vendors and established vendors. To find out the constraints in marketing of value added products of maize and suggest suitable measures to overcome them. The study was conducted in Raipur city of Chhattisgarh state. In which the Raipur city different sample was collect in randomly way. Out of the more than 50 established vendors, total 10 vendors were selected. Street vendors only select the corn related food vendors and collect the sample data from 20 street food vendors was selected out of all vendors. The primary data was collected through pre-tested structured interview schedule. Simple average and percentage methods was used for analyzing the data.

## Highlights

- Value-added products of maize provide a good amount of nutrients to the people. So awareness programme should be started at larger level for benefit of processor and consumers.

**Keywords:** Value added products of maize in Chhattisgarh

Maize (*Zea mays L*) or corn is a cereal grain belonging to the family Gramineae/ Poaceae and is known as 'Queen of Cereals' because of its several uses. Every part of the maize plant has economic value; the grains, leaves, stalk, tassel, and cob can all be used to produce a variety of food and non-food products.

Maize is one of the staple foods in India. The annual maize production in India is around 21 million tonne with the highest maize cultivation in Karnataka, Andhra Pradesh and Rajasthan. India is one of the largest cultivators of maize in the world, and it is a crop suitable for all the growing seasons in nearly every agro-climatic zone within the country's borders. India has seen a dramatic increase in maize cultivation over the past few years, which explains its pre-eminence as a starch source among processors. Traditionally, the grain is converted into flour in mills for making bread.

Immature cobs are roasted and eaten all over the country. It is an important raw material for animal and poultry feed and corn flakes manufacturing units. But the quantity of maize utilised by these units is limited as the existing units are of small scale nature. They make only a few products having limited demand. Whereas, a large scale unit can process a large quantity of maize to different value added products (Agro and Food Processing Govt. of Gujarat 2017).

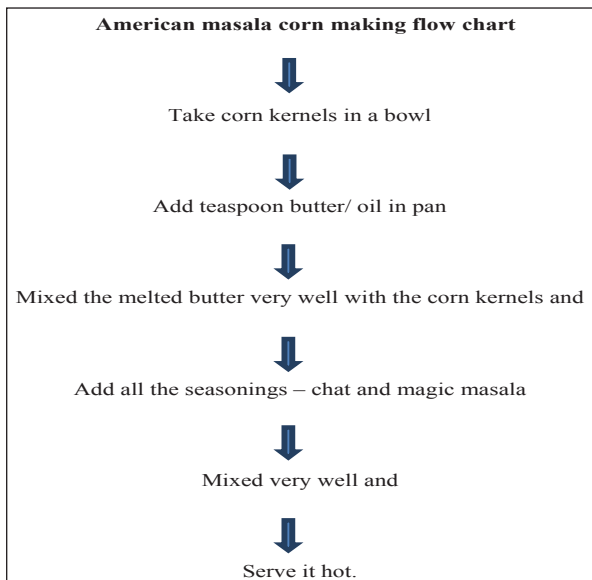
Maize is the second most-sought after crop after paddy preferred by farmers in Chhattisgarh. The crop is used in cornflakes, oil extraction, starch, making popcorn, organic fuel and for many other purposes, officials stated. Maize is mainly produced in Bastar district's 'Patar' region (Plateau area) and Surguja's hilly terrain during the *Kharif* season. It is grown in these areas in the courtyard for the past several generations. The tribal farmers grow Maize



and shift to taking up oilseeds crops. The farmers grow two crops on an unirrigated agricultural land in a year. The crop can be grown all over the year with irrigation facilities. After paddy, corn is the most popular crop among farmers in the State. The market is readily available for Maize whether it is for -maize seeds, for fodder, popcorn and many other purposes. Traders purchase corn directly from the farmers' fields in the villages. Sweet corn is also in several villages at present. The plateau areas of Bastar higher reaches and Surguja district's hilly terrain are ideally suited for cultivating corn crop. Maize in Chhattisgarh is one of major cereal crop as it contributes 114.62 thousand hectares' area in which have 193.98 thousand MT productions and productivity was 1692 kg per hectare in *kharif* (2015-2016). In Chhattisgarh it is the second important crop after rice because of favourable climatic condition of maize in Chhattisgarh. In Chhattisgarh area, production and productivity was continuously increasing. People of this state uses maize in many purposes many people grow maize for commercial purpose some use to grow it for animal feedings and for personal consumption too. Maize in Chhattisgarh is generally grown in *baadies* (area behind the house). It is generally grown in all season but *kharif* is highly suitable for its cultivation in this state.

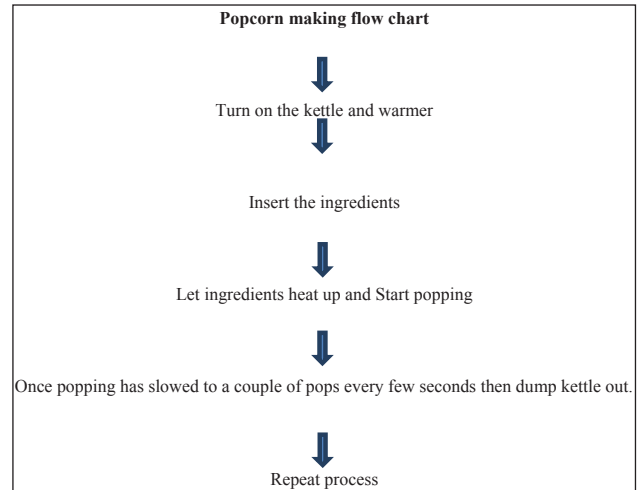
### MATERIALS AND METHODS

**American masala corn:** Wash corn properly and boil them in a pressure cooker. Take a wok, keep it on medium heat and melt butter in it.



After the butter melts, add sweet corn, chat masala, magic masala and salt to the wok and mix well. In the end add lemon juice mix well for one minute or two. Garnish with coriander leaf and serve it hot.

**Popcorn in cinema theatre:** The pop max corn packs consist of two easy to use pouches: one pouch contains popcorn pre-mixed with salt, the second pouch contains oil. Simply cut open both pouches and put the contents in the kettle to make within a few minutes.



### RESULTS AND DISCUSSION

#### 1. Established Vendors (Hotel and shopping malls)

##### (a) Cost production of American masala corn in Raipur city

American masala corn of sweet corn is one of the most popular food of value added products. Its demand in the shopping mall and restaurants of Raipur city is increasing steadily. Economics of american masala corn (per cup 125gm) at shopping mall is presented in Table 1. It reveals that the total variable cost for making of 125gm American masala corn was to be ₹ 23.15. The major cost was raw materials about 70.84 percent of the total cost. The benefit cost ratio was observed to be 1.16. and input output was 2.16.

##### (b) Cost production of popcorn in Raipur city

Popcorn trend has been going on in cinema theatres for a very long time. It is also known as a time-pass snake. Economics of popcorn (per cup 55gm) at shopping mall is presented in Table 2. It reveals

that the total variable cost for making of 55gm popcorn was to be ₹ 28.41. The major cost was raw materials about 38.72 percent of the total cost. The benefit cost ratio was observed to be 1.81. and input output was 2.81.

**Table 1:** Economics of american masala corn at (Per cup 125gm) shopping mall

| Sl. No. | Items                      | Quantity   | Average Cost/Return Per Cup (in ₹) | %age of Total cost |
|---------|----------------------------|------------|------------------------------------|--------------------|
| 1       | <b>Raw Materials:</b>      |            |                                    |                    |
|         | Sweet corn                 | 109.38 gm. | 16.40                              | 70.84              |
|         | Chat spices & Magic spices | 15.62 gm.  | 1.48                               | 6.39               |
| 2       | <b>Labour</b>              | —          | 2.5                                | 10.79              |
| 3       | Fuel/Power                 |            | 0.5                                | 2.15               |
| 4       | Packaging                  |            | 0.40                               | 1.72               |
| 5       | Other Production Cost      |            | 1.87                               | 8.0                |
|         | <b>Total Cost</b>          | 125 gm.    | 23.15                              | 100                |
| 6       | Sale price (Total return)  |            | 50                                 |                    |
| 7       | Net return/Benefit         |            | 26.85                              |                    |
| 8       | B/C ratio                  |            | 1.16                               |                    |
| 9       | Input/output ratio         |            | 2.16                               |                    |

Source: Personal survey.

**Table 2:** Economics of popcorn in PVR (Per cup 55gm) magneto mall

| Sl. No. | Items                     | Quantity | Average Cost Per Cup (in ₹) | %age of Total cost |
|---------|---------------------------|----------|-----------------------------|--------------------|
| 1       | <b>Raw Materials:</b>     |          |                             |                    |
|         | Pop Max corn              | 55 gm    | 11.00                       | 38.72              |
|         | Machinery cost            |          | 4.66                        | 16.40              |
| 2       | <b>Labour</b>             | —        | 6.5                         | 22.88              |
| 3       | Fuel/Power                |          | 2.5                         | 08.80              |
| 4       | Packaging                 |          | 3.50                        | 12.32              |
| 5       | Other Production Cost     |          | 0.25                        | 0.88               |
|         | <b>Total Cost</b>         | 55 gm    | 28.41                       | 100                |
| 7       | Sale price (Total return) |          | 80                          |                    |
| 8       | Net return/Benefit        |          | 51.59                       |                    |

|    |                      |      |
|----|----------------------|------|
| 9  | B/C ratio            | 1.81 |
| 10 | Input – output ratio | 2.81 |

Source: Personal survey.

## 2. Street vendors

### (a) Cost production of masala sweet corn in raipur city

Maize is a good employment solution for unskilled youth coming from the village. Economics of Masala sweet corn (per cup 114.6gm) at street vendor is presented in Table 3. It reveals that the total variable cost for making of 114.6gm masala sweet corn was to be ₹ 16.02. The major cost was raw materials about 48.06 percent of the total cost. The benefit cost ratio was observed to be 0.87 and input output was 1.87.

**Table 3:** Economics of masala sweet corn at street vendor

| Sl. No. | Items                      | Quantity | Average Cost Per Cup (in ₹) | %age of Total cost |
|---------|----------------------------|----------|-----------------------------|--------------------|
| 1       | <b>Raw Materials:</b>      |          |                             |                    |
|         | Sweet corn                 | 100gm    | 7.7                         | 48.06              |
|         | Chat spices & Magic spices | 4 gm     | 0.6                         | 3.74               |
|         | Lemon paper                | 0.6gm    | 0.22                        | 1.37               |
|         | Butter                     | 10gm     | 1.2                         | 7.49               |
| 2       | <b>Labour</b>              | —        | 4.0                         | 24.96              |
| 3       | Fuel/Power                 |          | 1.4                         | 8.73               |
| 4       | Packaging                  |          | 0.40                        | 2.49               |
| 5       | Other Production Cost      |          | 0.50                        | 3.12               |
|         | <b>Total Cost</b>          | 114.6gm  | 16.02                       | 100                |
| 6       | Sale price (Total return)  |          | 30                          |                    |
| 7       | Net return/Benefit         |          | 13.98                       |                    |
| 8       | B/C ratio                  |          | 0.87                        |                    |
| 9       | Input – output ratio       |          | 1.87                        |                    |

Source: Personal survey.

### (b) Cost production of popcorn in Raipur city

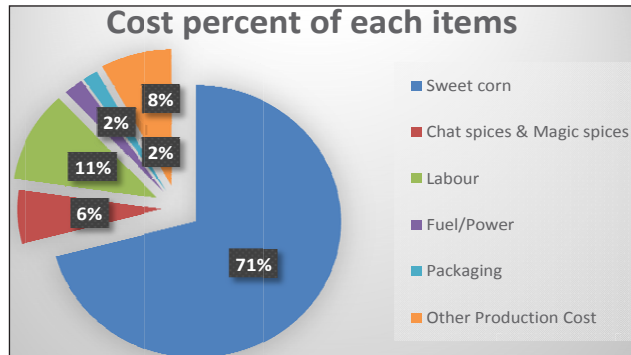
Economics of Popcorn (per cup 24gm) at street vendor is presented in Table 4. It reveals that the total variable cost for making of 24gm popcorn was to be ₹ 9.55. The major cost was raw materials about

3.35 percent of the total cost. The benefit cost ratio was observed to be 3.18 and input output was 4.18.

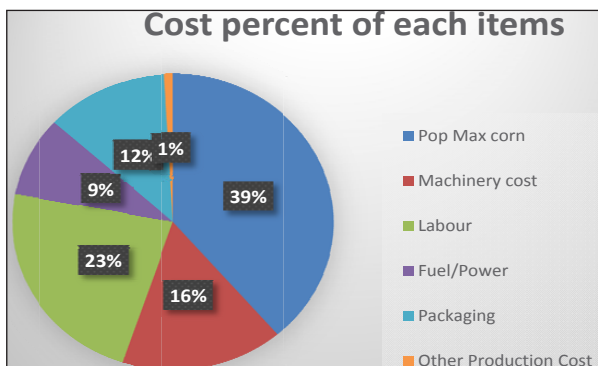
**Table 4: Economics of popcorn at street vendor**

| Sl. No. | Items                     | Quantity | Average Cost Per Cup (in ₹) | %age of Total cost |
|---------|---------------------------|----------|-----------------------------|--------------------|
| 1       | <b>Raw Materials:</b>     |          |                             |                    |
|         | Corn                      | 20 gm    | 0.32                        | 3.35               |
|         | Salt                      | 1.15gm   | 0.02                        | 0.20               |
|         | Chili powder              | 0.57gm   | 0.68                        | 7.12               |
|         | Turmeric powder           | 0.57gm   | 0.85                        | 8.90               |
|         | Oil                       | 1.71ml   | 0.17                        | 1.78               |
| 2       | Machinery cost            |          | 1.66                        | 17.38              |
| 3       | <b>Labour</b>             | —        | 3.55                        | 37.17              |
| 4       | Fuel/Power                |          | 0.55                        | 5.75               |
| 5       | Packaging                 |          | 1.50                        | 15.70              |
| 6       | Other Production Cost     |          | 0.25                        | 2.61               |
|         | <b>Total Cost</b>         | 24gm     | 9.55                        | 100                |
| 7       | Sale price (Total return) |          | 40                          |                    |
| 8       | Net return/Benefit        |          | 30.45                       |                    |
| 9       | B/C ratio                 |          | 3.18                        |                    |
| 10      | Input/output ratio        |          | 4.18                        |                    |

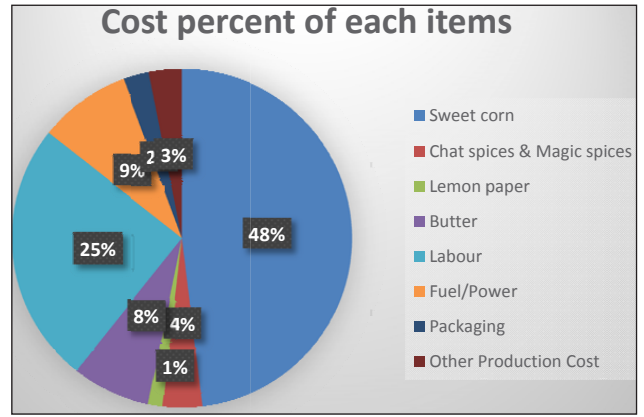
Source: Personal survey.



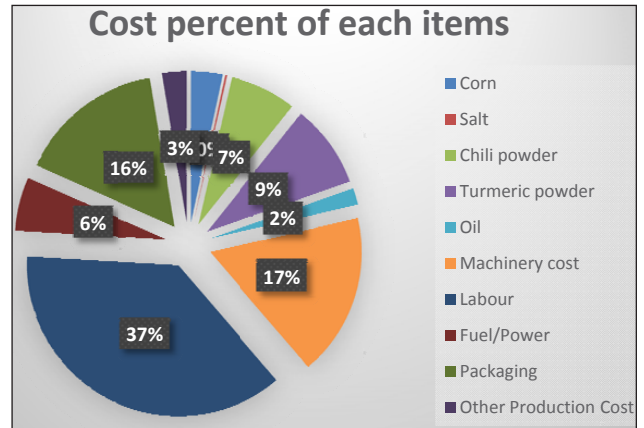
**Fig. 1: Economics of american masala corn at Shopping mall**



**Fig. 2: Economics of popcorn at shopping mall**



**Fig. 3: Economics of masala sweet corn at street vendor**



**Fig. 4: Economics of popcorn at street vendor**

## CONCLUSION

The total variable cost for making of 125gm American masala corn was to be ₹ 23.15. The major cost was raw materials about 70.84 percent of the total cost. The benefit – cost ratio was observed to be 1:1.16. and input – output ratio was 1:2.16., The total variable cost for making of 55gm popcorn was to be ₹ 28.41 The major cost was raw materials about 38.72 percent of the total cost. The benefit – cost ratio was observed to be 1.81. and input – output ratio was 2.81., The total variable cost for making of 114.6gm masala sweet corn was to be ₹ 16.02. The major cost was raw materials about 48.06 percent of the total cost. The benefit – cost ratio was observed to be 1:0.87 and input – output ratio was 1:1.87., The total variable cost for making of 24gm popcorn was to be ₹ 9.55 The major cost was raw materials about 3.35 percent of the total cost. The benefit – cost ratio was observed to be 1:3.18 and input – output ratio was 1:4.18.



## REFERENCES

- Abdulrahaman, A.A. and Kolawole, O.M. 2006. "Traditional preparations and uses of maize in Nigeria". *Ethnobotanical Leaflets*, **10**: 219-227.
- Dagla, C.M., Gadag, N.R., Kumar, N., Ajay, C.B. and Ram, C. 2014. "A potential scope of sweet corn for peri-urban farmers in India". *Popular Kheti*, **2**(1): 69-73.
- Fang, L., Wang, T. and Lamsa B. 2018. "Use of surfactant and enzymes in dry-grind corn ethanol fermentation improves yield of ethanol and distillers corn oil". *Industrial Crops & Products*, **111**: 329-335.
- Gwartz, A.J. and Garcia-Casal, N.M. 2014. Processing maize flour and corn meal food products. *Annals of the New York Academy of Sciences*. ISSN 0077-8923.
- Johari, A. and Kaushik, I. 2016. Sweet corn: new age health food. *International Journal of Recent Scientific Research*, **7**(8): 12804-12805.
- Kumar, Ranjit, Alam, K., Krishna, V.V. and Srinivas, K. 2012. "Value Chain Analysis of Maize Seed Delivery System in Public and Private Sectors in Bihar." *Agricultural Economics Research Review*, **25**: 387-398.
- Lee, S.Y., Kim, W.Y., Ko, J.Y. and Ha, J.K. 2002. Effects of corn processing on *in vitro* and *in situ* digestion of corn grain in Holstein steers. *Asian-Australian Journal of Animal Science*, **15**(6): 851-858.
- Mestres, C., Davo, K. and Hounhouigan, J. 2009. Small scale production and storage quality of dry milled degermed maize products for tropical countries. *African Journal of Biotechnology*, **8**(2): 294-302.
- Milind, P. and Isha, D. 2013. Zea maize: a modern craze. *International Research Journal of Pharmacy*, **4**(6).
- Mishra, V., Puranik, V., Akhtar, N. and Rai, G.K. 2012. Development and Compositional Analysis of Protein Rich Soyabean-maize Flour Blended Cookies. *Journal of Food Processing & Technology*, **3**: 9.
- Murdia, L. K., Wadhvani, R., Wadhawan, N., Bajpai, P. and Shekhawat, S. 2016. Maize utilization in India: an overview. *American Journal of Food and Nutrition*, **4**(6): 169-176.
- Nazni, P. and Bhuvanewari, J. 2011. Optimization of mixture flakes and nuts to formulate ready to eat breakfast bar using response surface methodology. *International Journal of Current Research*, **33**(3): 029-038.
- Najeeb, S., Sheikh, F.A., Ahangar, M.A. and Teli, N.A. 2011. Popularization of sweet corn (*Zea mays* L.) under temperate conditions to boost the socioeconomic conditions. *Maize Genetics Cooperation Newsletter*, **85**: 1-6.
- Pauline, M., Alexandreb, O., Andoseha, K.B., Abelinea, Suzanne, T.M. and Agathab T. 2017. Production technique and sensory evaluation of traditional alcoholic beverage based maize and banana. *International Journal of Gastronomy and Food Science*, **10**: 11-15.
- Ram, S. and Mishra, B. 2010. Cereals processing and nutritional quality. New India Publishing Agency. Pitam Pura, New Delhi, pp. 284-307.
- Yenagi N.B., Punia, D. and Punia, R.K. 1998, Consumers' Preferences and Consumption Pattern of Processed Food—A Study of Working & Non-Working Women. *Indian Food Packer*, **52**(3): 11-14.

