

# Simple Technologies for Processing Yak Meat Products



**National Research Centre on Yak**  
(Indian Council of Agricultural Research)  
Dirang, West Kameng District  
Arunachal Pradesh-790 101, India



## Introduction

Yak is the major source of meat for its rearing community. The optimum age for slaughter of yak is 5 years in male. Yak meat has great demand among the consumers especially during *Lossar*, a major festival of west kameng and tawang districts of Arunachal Pradesh, India. Yak meat is utilized by the local people in various forms and dishes viz. dried meat (*shia sangbu*), curry (*shia kamtang*), sausage (*juma*), chutney, *momo* and *thukpa*. There is hardly any scientific intervention in the processing of these products which leads to poor shelf life and high contamination by the spoilage organisms. Hygienic processing will preserve the nutritional quality of the meat and meat products which would ensure food safety of the consumers. The formulation, processing technology and quality of various yak meat products are enlisted below.

## Yak meat

Yak meat is rich in protein but low in fat. The proximate composition of yak meat is 74.77% moisture, 21.66% protein, 1.47% fat, and 1.21% ash. The water binding capacity is 10mL/100g meat. The ultimate pH of yak meat is 5.49. Yak meat is tender in nature with a muscle fiber diameter of 21.61 $\mu$ .

## Dried meat

Drying followed by smoking is the most common method of meat preservation practiced by yak rearers. Meat is dried without any pretreatment and then smoked by hanging over the oven for several days. In scientific processing, lean meat free from fat and connective tissue is used for the preparation of dried meat. The meat is cut along the muscle fibers into thin long strips (50 cm). The strips must be cut to a uniform shape maintaining the same diameter throughout the length. The long strips can be obtained by cutting the meat along the fiber in one direction without cutting through end of the meat. Strips with rectangular cross section of 1cm x1cm are most suitable for drying. The pickle curing is done with 100% meat strips, 14% salt, 1% sugar, 0.02% sodium nitrite and 0.05% sodium ascorbate in enough water to cover for 24 h at ambient temperature. The meat strips are washed once in cold water and drained using a sieve. Then the meat strips are suspended traditionally on a rope tied between wooden poles by using metal hooks/clips or strong thread loops. Sun drying of pretreated meat strips takes about 4 days. Where as drying of pretreated meat strips in an incubator at 50°C takes about 48h. The contact of meat strips are avoided



during drying. Then dried meat strips are packaged and stored at ambient temperature. Pretreatment prevents spoilage, maintains colour and gives longer shelf life for dried meat. The yield of scientifically processed dried yak meat is 32.25%. It has about 16.58% moisture, 38.46% protein, 2.96% fat and 2.56% ash. The rehydration index and water holding capacity of dried meat is 31.76% and 126.18% respectively. Whereas, field samples of dried meat contained about 22.35% moisture, 36.85% protein, 8.21% fat and 3.99% ash. The microbial load of dried yak meat samples obtained from field conditions has a standard plate count of 4.19 log cfu/g and yeast and mold count of 4.52 log cfu/g which is almost three times the values obtained in scientifically processed dried yak meat.

### Yak meat pickle

Yak meat pickle is a shelf stable product which can be stored for around 6 months at ambient temperature. Meat pickle can be prepared in both chunk and mince form. It is the best way to utilize excess dried yak meat which is available in surplus during festival season. The formulation of meat pickle include cooked yak meat 100%, broth 75%, refined mustard oil 35%, vinegar 30%, spice mix 4%, salt 3%, degi mirch 1%, citric acid 0.1%, sodium ascorbate 0.05% and sodium nitrite 0.02%. Dried yak meat can be rehydrated by keeping in warm water mixed with 2% salt at 50°C for 1h. The meat is pressure cooked for 20 min to utilize in pickle. The oil is heated in an open pan. Then cooked meat is fried until light brown colour appears. The fried meat is separated with a strainer. The spice mix and degi mirch are fried in the remaining oil. Then broth is incorporated along with sodium ascorbate, sodium nitrite and citric acid. The content is heated with constant stirring till boiling. Then the fried meat is added and allowed to boil for 2 min to reach product end point temperature of 90°C. The product is allowed to cool on its own. Then blend with vinegar, package in PET bottles and store at room temperature. The pickle can be served to the panelists after 3 days of maturation period. Meat pickle has pH of 4.65, titratable acidity 0.138%LA, moisture 51.57% protein 19.04%, fat 27.12% and ash 1.90%. The microbial profile of yak meat pickle comprises standard plate count of 1.54 log cfu/g and yeast and mold count of 1.96 log cfu/g.



### Yak meat momo

Yak meat momo is a traditional product of yak rearing states of India, which has great demand among ethnic people and tourists. The formulation of yak meat

momo include minced yak meat 100%, onion 85%, oil 25%, maida 15%, green chilli 5%, spice mix 2%, salt 2% and mono sodium glutamate 0.015%. All the ingredients except maida are mixed well with minced meat and batter is prepared. Some quantity of oil weighed is taken for smearing inner surface of the vessel and the remaining is used in the batter. Enough quantity of water is added to maida to prepare dough. Balls of 20g are prepared, rolled and flattened to make a round shape. About 20g batter is stuffed into the round flattened maida dough and sealed by giving different shapes which are raw momos. The inner surface of top three layers of cooking vessel (*moktu*) is smeared with oil. Water is kept in the



bottom layer and allowed to boil to generate steam. Once steam has generated, the upper three layers of vessel filled with raw momos are kept over the bottom layer and closed with lid. Cooking is done for about 20 min. The top layer may be seared for another 5 min to reach product end point temperature of 90°C. Yak meat momo indicated an average yield of 107.87%. The titratable acidity was 0.027% LA. The mean values of moisture, protein and fat contents were 52.13%, 19.37% and 23.98% respectively. The mesophilic and yeast and mold counts were 2.58 log<sub>10</sub> cfu/g and 2.73 log<sub>10</sub> cfu/g respectively. The sensory evaluation showed appearance, flavour, texture and juiciness scores of 7.75, 7.25, 7.38 and 7.5 respectively on 8-point sensory scale.



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**Director, NRC on Yak (ICAR)**

**Compiled & Edited by:**  
**Dr. Kandeepan G.**

**Designed by:**  
**Mr. Shyam Narayan Prasad**

**For details contact:**  
Director, NRC on Yak (ICAR)  
Dirang, West Kameng District  
Arunachal Pradesh-790 101, India  
Phone: +91-3780-242259  
FAX: +91-3780-242273  
Email: [yakdirector@gmail.com](mailto:yakdirector@gmail.com)

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