



***Study on Market Promotion and
Branding of Yak Cheese and
Chhurpi for Export***

FINAL REPORT



**National Dairy Development
Board (NDDB)**

Harhihar Bhawan, Lalitpur Nepal

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ACRONYMS

BIMSTEC:	Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation
CAC:	Codex Alimentarius Commission
CAGR:	Compound Annual Growth Rate
COB:	Clot on Boiling
CoC:	Code of Conduct
CoP:	Code of Practice
CHO:	Carbohydrate
CDCAN:	Central Dairy Cooperative Association Nepal
COVID-19:	Coronavirus Disease
DDC:	Dairy Development Corporation
DFTQC:	Department of Food Technology and Quality Control
DLS:	Department of Livestock Services
DMPCU:	District Milk Producers Cooperative Union
DOA:	Department of Agriculture
DOI:	Department of Industry
EU:	European Union
FGD:	Focus Group Discussion
FY:	Fiscal Year
FAO:	Food and Agriculture Organization of the United Nations (UN)
GATT:	General Agreement on Tariffs and Trade
GMP:	Good Manufacturing Practice
IFCN:	Dairy Data Knowledge Inspiration
IHDI:	International Himalayan Dairy Industries Pvt Ltd
KII:	Key Informants Interview
LC:	Letter of Credit
LAMEA:	Latin America, Middle East and Africa
MoALD:	Ministry of Agriculture and Livestock Development
MPC:	Milk Producers Cooperatives
NCS:	National Council for Standards
NEPC:	Nepal Environment Protection Center
NDDB:	National Dairy Development Board
NDA:	Nepal Dairy Association
NRs:	Nepali Rupees
NBSM:	Nepal Bureau of Standards and Metrology
OCN:	Organic Certification Nepal
OIE:	World organization for animal health
PDTA:	Patent, Design and Trademark
POA:	Power of attorney
QSRs:	Quick Service Restaurants
Qty:	Quantity
RAS:	Research Assistants
SNF:	Solid Not Fat
SAARC:	South Asian Association for Regional Cooperation
SOP:	Standard Operating Procedure
SPS:	Sanitary and Phytosanitary
TBT:	Technical Barriers to Trade
TPC:	Trade promotion Center
TS:	Total Solid
UN:	United Nations
USA:	United States of America
WHO:	World Health Organization
WTO:	World trade organization

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Dairy sector is one of the potential economic endeavour that contribute balancing rural, urban and global trade. Yak milk production takes place in high Himalayan Regions. Cheese and Chhurpi out of yak milk is also produced in Himalayan Region of Nepal. Consumption of these products takes place in urban areas of domestic market and international market globally. The total export of chhurpi reached to NRs. 1965.046 million.

The export of chhurpi also name as 'Dog Chew' predominates the private sector in different name, logo and brand. It is difficult to ascertain the quality of products produced by different producers scattered at very remote areas where small quantity of milk collected and not economic to sale in formal market. In absence of standard SOP, it is very difficult to understand the physico-chemical and bacterial quality. In such circumstances it is urgently need to regularize the export of the product.

Uniform trademark, logo and brand could be instrumental to regularize the export and set standard SOP followed by standard quality. National Dairy development Board (NDDB) could be an appropriate government institution to take trademark and operate collective mark system distributing to different producer. At the end the quality assurance would be under the NDDB jurisdiction. It shall ensure uniform quality.

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EXECUTIVE SUMMARY

Yak cheese is producing in high alpine region while chhurpi is produced from high hills to terai regions of Nepal. In the current years chhurpi alternatively named dog-chew is one of the export dairy commodities. It needs quality assurance and standard trademark to explore the commodity with unique quality and standard in the international market. It was realized to undertake one study to assess the exact situation of these products.

The general objective of the current study is to recommend strategies for market promotion of Yak Cheese and Chhurpi. The specific objectives are: Explore Yak cheese/Chhurpi value chain in Nepal, analyze the status of Yak Cheese/ Chhurpi production in the country along with production trend and future projection (Volume, production cost, market price); analyze current markets (internal and abroad) for the products (Cheese and Chhurpi) and explore possible expansions in global market; identify the gaps for market promotion and sustainability; identify marketing hurdles; assess quality parameters of the products and recommend to align the products quality with national and international consumers preferences and explore possibility of acquiring collective trademark for these niche products in the global market.

Using both the quantitative and qualitative approach study was undertaken. Majority of the data was collected through literature review and desk study. The quantitative approach involved structured questionnaire-based sample survey with farmers and qualitative information were collected from policy makers, policy implementing agencies, cheese/chhurpi producers, marketers and consumers.

Yak is Himalayan multipurpose domestic animal which graze at herbal land and produce milk to feed the Sherpas. Average milk production per yak is 1.5 liter, while hybrid i.e chauri produce a liter more milk than yak. Yak is also used as Himalayan Transport to carry loads.

It is understood that cheese production began some 8-10,000 years ago. It is a highly nutritious fermented milk product with diverse flavour and texture. When compared to whole milk (3-4% protein and fat), it contains 30-40% protein and fat along with other minerals and fat-soluble vitamins. Fewer varieties of cheese are available in Nepal compared to the European and American regions.

Due to increased awareness of the health benefits of cheese and expansion of cattle farming in Nepal, the demand and supply of cheese is in increasing trend. Worldwide 22,651,606 tons of cheese is produced per year. United States of America is the largest cheese producer in the world with 5,584,857 tonnes production per year.

Yak cheese production in Nepal started in 1953 while the chhurpi may have longer history. Nepal was the first country to produce cheese from yak/Chauri milk in the high alpine region of the country. This activity is focused in the districts of Mount Everest trekking route and the Rasuwa district, adjoining to the capital city and some other hill and mountain districts.

At present, cheese production is 520. 04 Mt while it is only 33.75 Mt, while in 1998/99 total cheese production was 350 ton and yak cheese was around 150 ton. In last two years, production and export of chhurpi/dog chew increased sharply, and export value was NRs. 1960 million. Nepal is signing member of different international convention: Codex, WTO, FAO, SAARC, OIE, BIMSTEC etc.

Yak cheese is an established name for the yak milk-based product and Yak cheese is almost an established brand name of Nepal and Dairy Development Corporation (DDC) has taken organic certification for the Yak Cheese and has well-established market, particularly in the tourist-dominated areas of Nepal and abroad. But low level of production and poor marketing channel is the constraints for the export. While on the other hand, quality of 'Dog Chew' is required further strengthen footing physico-chemical and bacterial parameters with Standard Operation Procedure (SOP).

Most of the chhurpi/ dog chew producers collect the milk cake in big flank shape from the farmers/or small entrepreneurs located at remote villages. It is thus one of the products to generate employment and collect urban capital to the very remote villages in Nepal.

Though, there is tremendous opportunities for growth of the yak cheese/chhurpi production, as they did not actualize that the farming is financially viable and youth farmers are draining to foreign employment.

Now, the situation is bit different, few yak/chaury activists are come in advocating for revival of yak/chaury farming there by yak cheese/ chhurpi production and advocating for yak circuit to be established along the hind-kus area. While The yak/chaury farmers are facing different problems viz: lack of infrastructure such as roads and electricity, quality yak breed, disease like FMD prevalence, poor vaccination, AI, feeding services, closure of alpine pasture and financing.

There are three problems for private yak cheese producers stemming from institutional constraints that are readily apparent. The problems include: (1) sub-optimal product quality, (2) sub-optimal firm organization and (3) the inability of private producers to pool resources for generic advertising

In FY 2078/2079, total import of cheese is 142013 kg while it was 129055 in FY 2068/2069. In FY 2077/2078 export was 38008 kg which was 11071 in FY 2068/2069. Total value of dog-chew export was NRs. 80.00 million in FY 2017/2018, which was NRs. 1965.046 in 2020/2021. The price of cheese and chhurpi is in increasing trend with annual increment from 3 to 5 percent in the domestic market. While trend of cheddar cheese price increment in international market is bit different as the fluctuation found to decrease or increase by 10 to 17 percent.

On the basis of low milk production and collection from Yak/Chaury and small entrepreneurs are involved in chhurpi making at interior parts of the country, micro entrepreneurs could be promoted for producing these products. Processing 500 liter of milk for yak cheese could have 24% IRR while and chhurpi could have 18 % IRR.

Following recommendations are made for the market promotion of yak cheese and chhurpi

Yak/Chaury management

Alpine pasture regeneration with sustainable yak stocking rate and control grazing scheme, subsidized credit but no grant for scaling-up to the economically viable for certain time frame, separate government yak breeding station are required for two pure lines for yak and one pure line for Chaury (fertile female) and Jhopka (infertile male) production to ensure immediate milk and required animal along lower altitude trekking routes. It is also required research and development on yak husbandry to conserve yak through sustainable utilisation and management of sheds at strategic location for mobile yak. Periodic and proper vaccination, reliable extension services along with AI, improvement in the pasture, proper housing, balance ration feeding, access to water for drinking, system for animal identification, adequate financing services and production-based grant shall be effective tools.

Infrastructure management

It is already mentioned in this report that, quality of both yak cheese is sub-normal while the quality of chhurpi is not understood. Hence, it is required to develop proper manpower at different level for management, processing and marketing. Establishment of physical facility for maintaining cold at all level: production, ripening, transportation, storage and wholesale and retail counters is recommended. Solar panel could be promoted for heating, cooking and lighting to cheese/chhurpi entrepreneurs and yak farmers. It saves yak dung that can be used for pasture revitalization.

Problem: Sub-optimal firm organization

Yak cheese production and its management are very costly. It is required to establish facilities at different stations until the product to reach in the market. While it is seasonal business only for 6 months in a year. For keeping manpower intact, business tailored with tourism is recommended

Problem: Inability of private producers to pool resources for generic advertising

Capital and human resource pooling and other promotional activities are crucial to operate for seasonal business. Only yak cheese production may not be sustainable, hence it is required to integrate the yak cheese/ chhurpi production with other business exploring group of industries.

Problem: Weak regulatory system in cheese/chhurpi production

In the context of increasing trend in chhurpi export, quality control and branding are utmost important. It is also required to strengthen Standard Operating Procedure (SOP), Good Manufacturing Practice (GMP), Code of Conduct (CoC), Code of Practice (CoP) for chhurpi manufacturing. Training on CoC, CoP, GMP and mentoring activities are to be implemented to assure the quality all level.

Problem: Cheese/chhurpi export in different label

Until now, it is being exported as 'Dog Chew' with different trade name. It could be better, if export in single trade mark. Trademark, brand name, branding, packaging and promotional activities are to be set appropriately. Regularizing the production and marketing of chhurpi by government owned agency and NDDB is the appropriate institution to take trademark and logo.

Problem: FMD free certification

Being a member country of WTO, SAARC, OIE, SPA, Codex BIMSTEC etc, it is essential FMD free certification to export. On the other hand, the chhurpi shall be prepared for human consumption as dairy products. In such circumstances, exercise for zoning the country, extensive vaccination program in selected zone and certification for FMD free in close coordination with above mentioned international institutions is recommended.

Problem: Difficulties to take trademark and export licencing

The cheese/producers are to be visited many institutions to get the certifications for export. Single door services for registration, quality test, disease free test, tax, trade and export services could be motivating factor for export.

Problem: Data generation

It is very difficult to establish database of the product produced, milk used, domestic consumption and export of yak cheese and chhurpi. It is required to clarify the code number for chhurpi and cheese from Nepal Foreign Trade Statistics. Effective data generation could be done by concern government agency in coordination with producers. In such scenario, it is recommended to take trademark for yak cheese and chhurpi from DOI by NDDB and distribute to cheese/chhurpi producers. Footing on this relation quality monitoring and data generation could be done by NDDB assigning an IT official. To take the trademark and logo for yak cheese and chhurpi NDDB is to undertake following:

1. Organize workshop/meeting with the Chhurpi and Cheese producers in the country
2. Register yak cheese and chhurpi producers/ entrepreneurs in NDDB
3. Follow all the steps mentioned above for trademark registration
4. Design separate logo/trademark for yak cheese and chhurpi
5. Submission of an application for registration of a trademark to the DoI
6. Get registration certificate of the trademark
7. Inform all the Chhurpi and Cheese producers on taking the collective mark
8. Prepare Nepali Chhurpi and Cheese certification Trademark Implementation directive
9. Prepare code of conduct and terms to be followed by the trademark user
10. Prepare procedural guideline on using the Chhurpi/Cheese LOGO
11. Prepare strategy for export of Nepali Chhurpi/Cheese
12. Prepare standard Nepali and export quality of Nepali Chhurpi and Cheese
13. Monitoring of the manufacturing practices undertaken by the trademark/logo users
14. Regularise the trademark users
15. Promotional activities in and outside of the country

CHAPTER-1. BACKGROUND

1.1 Introduction/Context

There are about more than 400 types of cheese being produced in the world. Yak cheese is one of the popular dairy products in Nepal, mostly produced in hilly districts of Ilam, Panchther, Dhankutta, Shankuwasabha, Dolkha, Ramechap, Makwanpur, Rasuwa, Nuwakot. Yak cheese production started in Nepal in 1952 after a factory was set up in Langtang with financial support from the World Food Organization and technical support from the Swiss government. The cheese produced is mostly being supplied to Kathmandu.

Nepal produces Yak cheese, *Kanchan* cheese (cow milk), *Mozzerella* cheese (both cow and buffalo milk), Tom Cheese and goat cheese. Cheese factory in Nepal collects 7665.43 MT milk and use 650.65 MT milk in cheese making and rest large amount of milk is used for Chhurpi making. Public sector (DDC) handle 27% of the above milk in preparing Yak, Mozerella and Kanchan processed cheese and rest of the milk (73%) is handled by privet cheese factories. A unique variety of hard acidic Yak cheese called "*Chhurpi*" is produced in Himalayan and midhills districts of Nepal.

Chhurpi is produced from skimmed milk (0.5% fat) after adding sour butter milk and is slowly smoked for 2-3 months to develop special taste and aroma. Both cheese and Chhurpi are a unique value-added niche dairy product of Nepal which has high market both within and outside the country. It is either produced at farm level or by small-scale entrepreneurs. No data are available on the amount of Chhurpi produced.

The hard cheese, known locally as *chhurpi*, is made from milk collected from NAKS (female yaks), cows and CHAURIS (a cross between yaks and local hill cows). An excellent source of protein, people throughout the Himalayan region, including Tibet, Darjeeling, Sikkim, and Bhutan, love this hard-to-chew cheese. However, CHHURPI is now a favored food for dogs in the United States and Europe. According to the Nepal government's Trade and Export Promotion Centre, in the fiscal year 2017/18, the country exported more than 800 million Nepalese Rupees (US \$7 million) worth of CHHURPI. According to local businessmen, about 60-70 percent of the CHHURPI exported as dog chew to the United States and Europe is produced in the Ilam district itself. Since this hard cheese is being exported to so many countries, including Canada, Germany, Hong Kong, India, Israel, Japan, Korea, Malaysia, Russia, Singapore, Taiwan, Thailand, United Arab Emirates, the United Kingdom and the United States, its manufacture has become a regular source of income for Nepal's rural farmers.

Some private dairies in Terai of Jhapa, Sunsari, Makwanpur, Baglung, Palpa, Arghakhanchi, Sindhuli etc. are also producing thousands kg of Chhurpi at the surplus season (flush season). Recent data from department of custom shows increasing trend of export of chhurpi in the brand of dog chew. Globalization of trade by large multinational processors is the emerging characteristics of the dairy industry and leads to increased competition in the market. Dairy-exporting developed countries have lower costs of production than developing countries and they provide export and production subsidies on it.

According to Planning Monitoring and Evaluation Section, Ministry of Livestock Development, 2017, there were a total of 48865 heads Yak/Chauri and milking Yak were 11020. Total milk collection was 451361 lit (last 4 months). Currently, there are 9 DDC (Government Owned) Yak milk collection/Cheese production Center and 2 Private Yak milk collection/Cheese production Center in Nepal.

State-owned Dairy Development Corporation has produced 38 tonnes of cheese and 12 tonnes of butter since mid-April of (FY 2017/18), a result of an increase in yak farming in the northern district. Yak derived product volumes in the country have been growing at 10 percent a year.

Local traders in Rasuwa say the value of yak cheese amounted to Rs 69.62 million and Rs12.4 million

for butter which helped improve the lives of farmers. Chandanbari, Dhunchhe, Gatlang and Langtang are the key cheese and butter producing centres of the corporation. Cheese and butter made from Yak's milk are popular with Nepalis as well as the foreign tourists.

It is also a major income-generating occupation for the people in the mountain region. These dairy commodities have a huge export potential, both in Asia and other markets around the world.

1.2 Objectives of the Assignment

The general objective of the current study is to recommend strategies for market promotion of Yak Cheese and Chhurpi with the following specific objectives to:

- Explore Yak cheese/Chhurpi value chain in Nepal
- Analyze the status of Yak Cheese/ Chhurpi production in the country along with production trend and future projection (Volume, production cost, market price)
- Analyze current markets (internal and abroad) for the products (Cheese and Chhurpi) and explore possible expansions in global market
- Identify the gaps for market promotion and sustainability
- identify marketing hurdles
- Assess quality parameters of the products and recommend to align the products quality with national and international consumers preferences
- Explore possibility of acquiring collective trademark for these niche products in the global market

1.3 Scope of the Assignment

As per the TOR provided by the Client and given objectives, the specific tasks or scope of the assignment to be performed by the consultant were:

- Review current Dairy Development and other relevant government policy documents in relation to milk, milk product diversification, promotion and branding.
- Review codex, OIE code, SPS agreements, national legal documents related with production and trade of cheese and Chhurpi.
- Map Cheese and Chhurpi production areas in the country
- Assess and estimate milk volume used and products produced (Cheese and Chhurpi) annually at industry and household/farm level
- Identify and document types of Yak Cheese and Chhurpi produced with grading of products.
- Physico-chemical quality of cheese and Chhurpi tested at DFTQC for international marketing
- Estimate cost of production of Yak Cheese and Chhurpi
- Analyze trend and price of Yak Cheese and Chhurpi over last 10 years in national and international market and make projection for next 10 years.
- Explore other players outside country who are involved in production and/or sale of these products
- Analyze import and export of Yak Cheese and Chhurpi in last 10years and make projection for next 10 years.
- Enlist producer farmers and/or their associations, industries, major exporters of chhurpi from Nepal

- Identify gaps hurdling the trade and recommend suitable measures to overcome it
- Develop a viable business plan for quality Yak Cheese and Chhurpi production
- Explore/Identify need for capacity building (logistics/human resource) for quality assurance
- Explore, and recommend steps for acquiring collective trademark for the international market promotion.

1.4 Methodology

1.4.1 Desk study

The literatures/ documents related to codex, OIE code, SPS agreements, national legal documents related with production and trade of cheese and Chhurpi, estimate milk volume used and products produced (Cheese and Chhurpi) annually at industry and household/farm level, types of Yak Cheese and Chhurpi produced with grading of products, physico-chemical quality of cheese and Chhurpi tested at DFTQC for international marketing, import and export of Yak Cheese and Chhurpi in last 10 years producer farmers and/or their associations, industries, major exporters of chhurpi from Nepal, trend and price of Yak Cheese and Chhurpi over last 10 years in national and international market etc. were collected and reviewed.

1.4.2 Consultation with concern authorities of NDDDB

The NEPC Consultant team visited and consulted concerned personnel at NDDDB to obtain the available reports about the project and other potential sources for relevant information on Yak Cheese and Chhurpi production, branding and marketing. The consultation meeting helped the consultant and to understand the priority areas of concerns of study and coverage and depth of analysis to be carried out during the study. The Consultant team will meet and consult on regular basis to seek necessary guidelines on each

1.4.3 Survey tools development

Based on the review of literatures, documents of the similar studies and consultative meetings with concern authorities in NDDDB, draft survey tools have been prepared for different value chain actors and research methods in Cheese and Chhurpi. The survey tools are presented in Annex: 2

1.4.4 Survey Districts

Following is the list of districts to be covered to conduct study:

Table: 1 Survey districts

Province	Districts
Province 1	Ilam, Dhankutta, Taplejung, Terhthum, Panchthar, Shankhuwasabha, Sunsari, Jhapa
Bagmati province	Dolkha, Ramechap, Makwanpur, Rasuwa, Nuwakot, Kavre, Makwanpur, Solukhumbu, Kathmandu Valley
Gandaki Province	Baglung, Myagdi, Parbat
Lumbini province	Arghakhanchi, Palpa

1.4.5 Sampling

Producers and marketers/traders of Yak Cheese/Chhurpi were taken as two strata for sampling. It was found that, there were 12 yak cheese producing and 17 privately owned Kanchan cheese producing factories. While nearly 240 chhurpi producers in the country. Out of them following number of samples was selected for the study.

Table: 2 Summary of sample

Province	Districts	Chhurpi producer	Yak Cheese Producers	Marketers/ traders	FGD	KII	Farmers
Province 1	Ilam, Dhankutta, Taplejung, Terhthum, Panchthar, Shankhuwasabha, Solukhumbu, Sunsari, Jhapa	9	2	4	5	16	32
Bagmati province	Dolkha, Ramechap, Makwanpur, Rasuwa, Nuwakot, Kavre, Kathmandu, Bhaktapur, Lalitpur.	9	2	4	5	18	32
Gandaki Province	Baglung, Myagdi, Parbat	3	0	2	3	6	12
Lumbini province	Arghakhanchi, Palpa	3	0	2	2	4	8
	Total	24	4	12	15	44	84

1.4.6 Selection and training to the Research Assistants

Research Assistants (RA) were selected administering the interview. One day training was organized to orient them on the project goal, objectives, methodology of the research, sampling design, sampling process, sample size, quality control of the data collection processes. Participants were provided opportunity to have experiential learning about using the designed data collection tools in real life situation. After the training session, participants undertook simulation exercise using role play method. Based on the experience gained through simulation exercise, the resource persons collected the feedback from the participants and survey tools/questionnaires were revised accordingly.

For data collection a team with two Research Assistants (RAs) were formed to conduct the survey. They took interview with the Key Informants (Yak Cheese and Chhurpi producers and suppliers/marketers/exporters/importers, associations, unions and government line agencies viz Palika level industry department, Department of custom and others. Also conducted FGD and corner meeting with milk producing farmers, entrepreneurs and others.

1.4.7 Inception report

Based on the literature/documents review, consultation meeting with concern authorities survey tools was prepared and submitted to NDDB for approval.

1.5. Methods of data collection from the field

The entire work was done in close coordination of the NDDB, Ministry of Agriculture and Livestock Development (MoALD). Department of Food Technology and Quality Control (DFTQC) was taken in the close loop. Given the objective and scope of the assignment, a combination of qualitative and quantitative methods was applied to conduct this study. It was considered that considerable

information/data required for achieving the objectives of the assignment was collected from secondary sources (both published and unpublished). The Consultant team visited and collated relevant information from available sources. Other information/data was collected from primary sources to supplement and verify the information collected from secondary sources. The methodological steps to be followed for collection of the necessary information from both secondary and primary sources have been briefly described below:

The data collection was undertaken using different methods respecting the COVID-19 protocols like face-to-face interview, group discussion physically or webinar, messenger web, zoom, telephone whichever possible.

1.5.1 Meeting in Ministry MoALD

On the mid-way of the study period, MoALD organized a meeting in NEPC research team was also invited in the meeting. Meeting was chaired by Joint Secretary Dr. Narayan Sharma Poudel, where representatives of MoALD, DLS, NDDB, DFTQC were present in the meeting. NEPC brief on the progress and present preliminary findings of the study. The meeting provided feedback and relevant information on cheese and chhurpi.

1.5.2 Key Informant's Interview

Key Informant Interview (KII) was done using the semi-structured checklists, The key informants were among others: Yak Cheese and Chhurpi producers and suppliers/marketers/exporters/importers, associations/ unions, FNCCI and government line agencies viz Palika level industry department, Department of Food Technology and Quality Control (DFTQC), department of custom, NDDB and Department of Industry, Commerce and import/export and other relevant institutions and scholars.

1.5.3 Focus Group Discussion (FGD)

FGDs with 7-10 participants comprised of the representatives of farmers and their organizations including small entrepreneurs using FGD guide. The FGD participants were selected maintaining gender balance and inclusiveness. Discussion was organized at the convenient location for all the potential participants. Participants coverage were Milk Producers Cooperatives/ collection center, farmers group and household chhurpi producers.

The qualitative information and opinion expressed by the participants provided valuable information and reliable basis for verification and validation of the quantitative information collected through other secondary and other primary sources during the course of study and assessment of the key aspects of the study.

1.5.4 HH survey:

HH survey was done using structured questionnaire to Yak/Nak farmers on milk production status and scale of production, problems and solution measures.

1.5.5 Online meeting

Online meeting with major stakeholders was utilized when it was not possible physical gathering. Yak Cheese/ Chhurpi producers, marketers/traders/suppliers, government line agencies to collect the information.

1.5.6 Secondary Information Collection

Secondary data were collected using the semi structured check list. This information was collected from department of custom, different custom offices, NDDB, Associations/Unions of the Yak Cheese/Chhurpi Producers, IFCN, Dairy Asia, export and import department and others.

1.5.7 Data Management and analysis

Quantitative data: All completed questionnaires were stored separately in a confidential place at NEPC office. Questions with open-ended responses was coded manually. A database was designed using MS-Excel. All data was entered by trained personnel. Ten per cent of each day's entered data was checked by the data manager to control errors. Data was checked for out-of-range values and inconsistencies between variables. The data was analyzed and presented both in the tabular and graphical forms.

Qualitative data: Qualitative data collected through FGDs and KIIs with respondents was organized by key issues and themes and the answers to questions within the themes were grouped and summarized in data analysis frameworks. Deductive approach was implied where similarities and dissimilarities among the responses was found. Method of content analysis was also employed for classification, summarization and analysis both at the descriptive and interpretative levels.

1.6 Report preparation

1.6.1.1 Draft report

Draft report was prepared based on the information collected from both the secondary and primary sources. The data collected from different methods and tools was triangulated for its reliability and validity before analysis. Besides analyzed tables, the report also included pictures, graphs, diagrams, narrative analysis, and other inferential statements that sufficiently extrapolate the prevailing situation of key objective indicators of study. The was submitted to NDDB for comments and suggestions.

1.6.2.2 Validation and dissemination of draft report

The draft report was disseminated for validation on 21st June 2022 to NDDB in presence of major dairy stakeholders including MoAD, DIA, NDA, CDCAN, DDC and dairy scholars. Comments and suggestions were collected from the stakeholders for further improvement in the report.

1.6.3 Final Report

After incorporating the relevant comments, suggestion and feedback from NDDB and other stakeholders' final report have been prepared and submitted to NDDB detail in English and summary in Nepali language.

CHAPTER-2

CHEESE PRODUCTION AND MARKETING

2.1 History of Cheese Production

According to National Historic Cheesemaking Center Museum, Green Country Welcome Center: Cheesemaking practice is closely related to the domestication of milk producing animals; primarily sheep, which began 8-10,000 years ago. The art of cheesemaking is referred to in ancient Greek mythology and evidence of cheese and cheesemaking has been found on Egyptian tomb murals dating back over 4000 years. Cheese may have been discovered accidentally by the practice of storing milk in containers made from the stomachs of animals. Rennet, an enzyme found in a stomach of ruminant animals, would cause the milk to coagulate, separating into curds and whey. Another possible explanation for the discovery of cheese stemmed from the practice of salting curdled milk for preservation purposes. Still another scenario involved the addition of fruit juices to milk which would result in curdling the milk using the acid in the fruit juice.

Definition:

Cheese is the fresh or matured solid or semi-solid product obtained:

- a) By coagulating milk, skim milk or partly skimmed milk, whey, cream or butter milk or any combination of these materials, through the action of rennet or other suitable coagulating agents and by partially draining the whey resulting from such coagulation, or
- b) By processing techniques involving coagulation of milk and/or materials obtained from milk (provided that the whey protein casein ratio does not exceed that of milk) and which give an end product which has similar physical, chemical or organoleptic characteristics as the product defined under (a).

Cheesemaking in the Roman Empire:

Despite the fact that the origin of cheese and cheesemaking is shrouded in mystery, we do know that by the time of the Roman Empire, cheesemaking had become a widespread, highly valued process practiced throughout Europe and the Middle East. By the time of Julius Caesar, literally hundreds of varieties of cheese were being produced and traded across the mighty Roman Empire and beyond. The Roman influence through documentation and trial and error also aided in refining and improving the techniques employed to make cheese.

Many of the popular cheeses we eat today, such as Cheddar, Swiss, Parmesan and Gouda, are relatively new to the cheese story (appearing within the last 500 years). In its early history cheese was never a worldwide phenomenon. As cheesemaking flourished in Europe and the Middle East, North and South America were completely void of cheese and the art of cheesemaking until much later when it was introduced by European immigrants.

Introduction of Cheese to Asia

European expansion and later American influences are generally credited with the introduction of cheese to Asia. Cheese is still not considered to be a regular staple in the diet of most Asian countries. However, there is evidence of a cheese called “rushan” that has been produced in China since the time of the Ming Dynasty. This cheese is a primary component of the diets of the

Sani and Bai people of China to this day. The Tibetans and Mongolians also have a long history of producing cheeses and may have had a role in the development of Chinese cheesemaking.

Cheese Varieties

According to Review Article J. Food Sci. Technol. Nepal, Vol. 11(14 - 24), 2019 ISSN: 1816-0727: Cheese was believed to be evolved from Tigris and Euphrates rivers (current Iraq) 8,000 years ago when people started to domesticate plants and animals as a source of food (Fox, 2011). The earliest cheese was made in Central Asia by Nomadic tribes (Dalby, 2009; Scott, Robinson, & Wilbey, 1998). However, more than 1400 kinds of cheeses are listed in a record of the University of Wisconsin Centre for Dairy Research (CDR, 2014). Nevertheless, there are 18 common types of cheese and they are: Brick, Trappist, Camembert, Neufchatel, Roquefort, Edam, Gouda, Sapsago, Hand, Cheddar, Limburger, Provolone, Cottage, Cream, Parmesan, Romano, Swiss and Whey cheese (McSweeney, Ottogalli, & Fox, 2017). There are different schemes of cheese classification and they are; (i) classification scheme is based on texture: acidification characteristics (both rate and time), from the point of setting the milk up through the manufacture of the young or fresh cheese, which define the mineralization level of the casein but also moisture loss; (ii) classification scheme based on method of coagulation: transform the original cheesemaking milk into a gel or coagulum (e.g., acid versus rennet); (iii), classification based on ripening indices: additional steps during the cheesemaking process controlling moisture levels of the young cheese (e.g., cooking temperature and pressing and salting conditions). Also, in the case of ripened cheeses, it is important to consider the characteristics of the ripening conditions (temperature, relative humidity, and rates of O₂, CO₂, and NH₃) that ultimately influence the character and diversity of cheese microflora. Under aforementioned schemes, there are several classes of cheese, and they are:

1. Extra hard varieties (Grana Padano, Granone Lodigiano, Parmigiano Reggiano, Asiago, Bagozzo, Bra, Formai de Mut; Pecorino Romano, Pecorino Sardo, Pecorino Siciliano, Pecorino Toscano, Pecorino Pepato, Fiore Sardo etc.)
2. Cheddar and related varieties (The British Territorial varieties, Cheshire, Derby, Gloucester, and Leicester, are dry-salted cheeses).
3. Cheese with propionic acid fermentation (Semi-hard cheeses such as Maasdamer, Leerdamer, and Jarlsberg. Gruyère etc.)
4. Gouda and related varieties (Edam, Maribo, Danbo, Colonia, Hollanda, Norvegia, and Svecia).
5. Pasta filata cheese (Mozzarella, Mozzarella di Bufala, Mozzarella di vacca, Caciocavallo, Cascaval, Kashkaval, Provolone, Kasseri, and Kasarpeyniri).
6. Cheese ripened under brine (Feta, Domiati, and related cheeses such as Brinza, Beli Sir, Telemes, Kareish, BeyazPeinir etc.).
7. Blue cheese [fermented by *P. roqueforti*, Bleu d'Auvergne, Cabrales, Gorgonzola, Danablu (Danish Blue), and Stilton]
8. Sheeps', Goats' and Buffalo milk cheese.
9. Acid curd cheese (Cream, Cottage, Quarg, some Queso Blanco (McSweeney et al., 2017).

2.2 Current status of Cheese Production in the World

Worldwide 22,651,606 tonnes of cheese is produced per year. United States of America is the largest cheese producer in the world with 5,584,857 tonnes production per year. Germany comes second with 2,740,582 tonnes yearly production. With 1,886,044 tonnes of production per year, France is the third largest producer of cheese. United Kingdom, with 410,000 tonnes of production per year is ranked at 11 (Source World Cheese Production by Country - AtlasBig.com, <https://www.atlasbig.com › en-gb › countries-by-cheese>). The cheese production in the world by countries is presented in Annex: 3.

Table: 2.1 Top Ten Cheese Producing Countries in the World

SN	Country	Production (Tons)	Production per Person (Kg)
1	United States of America	5,584,857	17.039
2	Germany	2,740,582	33.122
3	France	1,886,044	28.026
4	Italy	1,253,842	20.746
5	The Netherlands	771,941	44.747
6	Poland	744,044	19.359
7	Russian Federation	664,000	4.521
8	Egypt	628,750	6.449
9	Czech Republic	568,577	53.572
10	Argentina	558,907	12.561

Source: World Cheese Production by Country - AtlasBig.com, <https://www.atlasbig.com › en-gb › countries-by-cheese...>

2.3 Cheese Production in Nepal

The first cheese industry in Nepal dates to in 1953, when the government- started producing Yak cheese with the support of the FAO in Lamtang Rasuwa district. A Dairy Development Section was established under the Department of Agriculture (DoA) and a small-scale milk processing plant was started in Tusal village in Kavre district. In 1955, a Dairy Development Commission was formed (FAO, 2010). Several small-scale cheeses makers-initiated production of Swiss Emmental and French Cantal type cheeses in Langtang and Ilam (Nepali Times, 2018).

At present there are 15 small and medium scale cheese industries in so far in Nepal, registered in the Department of Food Technology and Quality Control (DFTQC) and other offices under this department (DFTQC, 2020).

Fewer varieties of cheese are available in Nepal compared to the European and American regions e.g yak, buffalo, Kanchan (cow) and processed cheese are being produced. Due to increased awareness of the health benefits of cheese and expansion of cattle farming in Nepal, the demand and supply of cheese is in increasing trend. Cheese manufacturing could be an attractive venture to overcome the milk holiday in the surplus season. By meeting the quality standards set by national and international bodies, there may be huge opportunity for exporting the cheese. However, still many dairy manufacturers are not aware about cheese production technologies and their implications.

Table 4.3 below explains on the status of cheese production in Nepal. Mainly Yak, Kanchan and Chhurpi (hard Cheese/ dog chew) are being produced. It was found that, a total of 528.04 Mt cheese and 1134.81 Mt chhurpi was produced in 2020/21. Yak cheesed constituted 2.51 percent while that of Kanchan cheese production was 29.24 percent and chhurpi / hard cheese/ dog chew production was 68.524 percent.

Table: 2.2 Current Status of Cheese Production in Nepal

SN	Cheese	Annual Milk (Lits)	Cheese (Mt)	Percent
1	Kanchan	5570920.64	486.29	29.24
2	Yak	349702.7	41.75	2.51
3	Chhurpi	25218000	1134.81	68.24
	Total	5912623.34	1662.85	100.00

Source: Field Survey 2022

Yak cheese production concentrated in the high hill Alpine area while Kanchan Cheese in mid hill specially in Ilam, Panchthar, Dhankuta districts. On the other hand, Chhurpi production spread in all geographical areas from high hills, hills, and Terai districts too. List of cheese producers is presented in Annex: 4

2.4 Yak Cheese and Chhurpi Production and Marketing

2.4.1 The Yak Cheese

Yak cheese production in Nepal started in 1953. Yak milk traditionally processed into fermented milk, and then churned out to produce local yak butter and buttermilk. Buttermilk is further processed into Sher, a cottage cheese type product. If fermented, produces sewsew, and if pressed and dried or dried without pressing it becomes Chhurpi, a dried hard casein product. Chhurpi is widely consumed by Himalayan people as a source of nutrients and is chewed to maintain salivation during mountain climbing. Traditional and indigenous technologies are in place to produce milk products that have long shelf life in the yak rearing countries of China, Bhutan, India, Mongolia, Pakistan, Nepal and so on. There is a need to upgrade the existing indigenous technology to produce safe and hygienic yak milk products at commercial scale (Source: Yak Cheese - CooksInfo, <https://www.cooksinfo.com › Dairy › Cheese>)

2.4.2 Type of Yak Cheese

a) Chhurpi is a cheese:

Chhurpi is a cheese made in Tibet, Bhutan and Nepal. It is as hard as a piece of chalk. The cheese can be chewed as a snack while travelling, or ground into a powder for use as a condiment in soups.

b) Churtsi is a yak cheese

Churtsi is a yak cheese made in Bhutan. It can be made from milk from a dry (female yak) or from a chauri (a cross between a cow and a yak). To make churtsi, a yoghurt which called "dhai " is first churned for butter.

c) Rajya Metok

Rajya Metok is a yak cheese being developed in Tibet for Western tastes. It is exported to the West and not really consumed in Tibet, aside from a small amount sold to tourists. The cheese is a semi-firm, stirred-curd cheese made in wheels about 16 inches.

d) Serkam / Dartsi cheese

To make Serkam / Dartsi cheese, dri (female yak) or chauri milk is fermented into a yoghurt called "dhai", then churned and used as butter. The buttermilk left from the butter-making process is then boiled and drained.

2.4.3 Yak Cheese production period

Yak cheese production is only possible for maximum of 6 months in a year. This is because of following facts on Yak/Nak/Chauri farming:

Yak/Nak

- The age of first calving is 48 months,
- The milk yield is 470 Lt/lactation
- The calving interval is 687 days,
- The lactation length is about 174 days.

Chauri:

- The age of first calving is 36 months,
- The milk yield is 1960 Lt/lactation
- The calving interval is 425 days,
- The lactation length is 254-400 days.

Generally breeding takes during the months of August to November and calving takes place in the months of April to July. Milk production capability of a Chauri is more than Nak. The milk produced from Nak and Chauri are used for making Yak cheese.

2.4.4 Yak Cheese Production Center in Nepal

There were 12 cheese production centers in the sampled districts. Out of them 10 were DDC owned and two privately owned.

Table: 2.3 Yak cheese production centers in Nepal

SN	Yak Cheese Production Center	Ownership	District
1	Gosaikunda	Dairy Development Corporation (DDC)	Rasuwa
2	Chordung	Dairy Development Corporation (DDC)	Dolkha
3	Langtang	Dairy Development Corporation (DDC)	Rasuwa
4	Thodung	Dairy Development Corporation (DDC)	Ramechhap
5	Pike	Dairy Development Corporation (DDC)	Solukhumbu
6	Chankhu	Dairy Development Corporation (DDC)	Dolkha
7	Gatlang	Dairy Development Corporation (DDC)	Rasuwa
8	Dhunchhe	Dairy Development Corporation (DDC)	Rasuwa
9	Tatopani	Dairy Development Corporation (DDC)	Sindhupalchowk
10	Thuman	Dairy Development Corporation (DDC)	Rasuwa
11	Ramechhap, Khate (Goth)	Duppa Sherpa	Ramechhap
12	Dolkha, Jiri	Ganga Bdr Jirel	Dolkha

Source: DDC and Field Visit

Gosaikund, Dhunchhe, Gatlang and Langtang are the key cheese and butter producing centres of the DDC. Cheese and butter made from Yak's milk are popular with Nepali people and foreign tourists alike. Milk of 1,900 yaks is supplied at the four cheese centres of Rasuwa under Dairy Development Corporation. Chief of Langtang Cheese Centre, Gyalbo Tamang, said that around 2,150 litres of milk are collected every day. Farmers selling yak milk get Rs 100 per litre of milk and 87 farmers have been benefitted from this.

Gosaikund Cheese Centre has moved ahead with a target to



produce 7,000 kg of cheese and 1,500 kg of butter, as well as 6,000 kg of cheese and 2,000 kg of butter by Langtang cheese centre as per DDC's direction to run the centres only for three months. Dhunche centre has set a target to produce 8,000 kg of cheese and 2,400 kg of butter while Gatalang centre has been producing cheese and butter without any target.

Private Cheese production centres in sampled districts have been closed. Only two farmers are producing Yak Cheese out of milk produced in their own yak herd.

2.4.5 Yak Cheese Production Technology

Yak cheese manufacturing process begins with the quality control of milk received for its manufacture. Besides the basic platform test of milk, which includes test for fat content, SNF content, acidity as lactic acid, Clot-on-boiling test, alcohol test and organoleptic tests all of which ascertains the quality of milk, hygiene aspects like cleanliness of containers in which the milk is brought and



personal hygiene of handler are equally considered as integral aspects.

Milk standardized at 3.5% fat is batch pasteurized in cheese vats and then cooled to an optimum temperature range of 33°C to 37°C before inoculating the milk with 1% starter culture comprising of a mix of *Streptococcus thermophilus* and *Lactobacillus helveticus*. This is followed by addition of rennet at the rate of 1.5 to 2.5

gms /100 ltrs milk and then the milk is stirred for few minutes. The milk is incubated for 30 minutes to convert the milk into the curd, then the curd obtained is cut horizontally and vertically using cheese strings followed by draining 30% of the whey obtained.

The cheese curd is cooked by raising the temperature of curd to 50°C within a time span of half an hour. This is followed by stirring the curd using cheese strings. The curd is then further strained with the aid of cheese cloth and then moulded in cheese hoops. This is followed by pressing the curd in hoops using weights equivalent to 1 to 2 times the weight of curd.



The pressed curd block is turned over at regular intervals after which it is left overnight under pressure. The raw cheese blocks obtained are then immersed in brine solution for two days. This is followed by holding the cheesecakes on a rack for a day followed by storage in a ripening room for a fortnight. During this period, the cheesecakes are washed in brine every day and alternately afterwards until the Yak cheese is completely ripened

after about two and half months.

After ripening, fat, moisture, and salt testing of cheese is done. The cheese is sent to the market after packing in a required retail pack size. Yak cheese is hard, and its shelf life is 1.5 to 2 years (DDC, 2020).



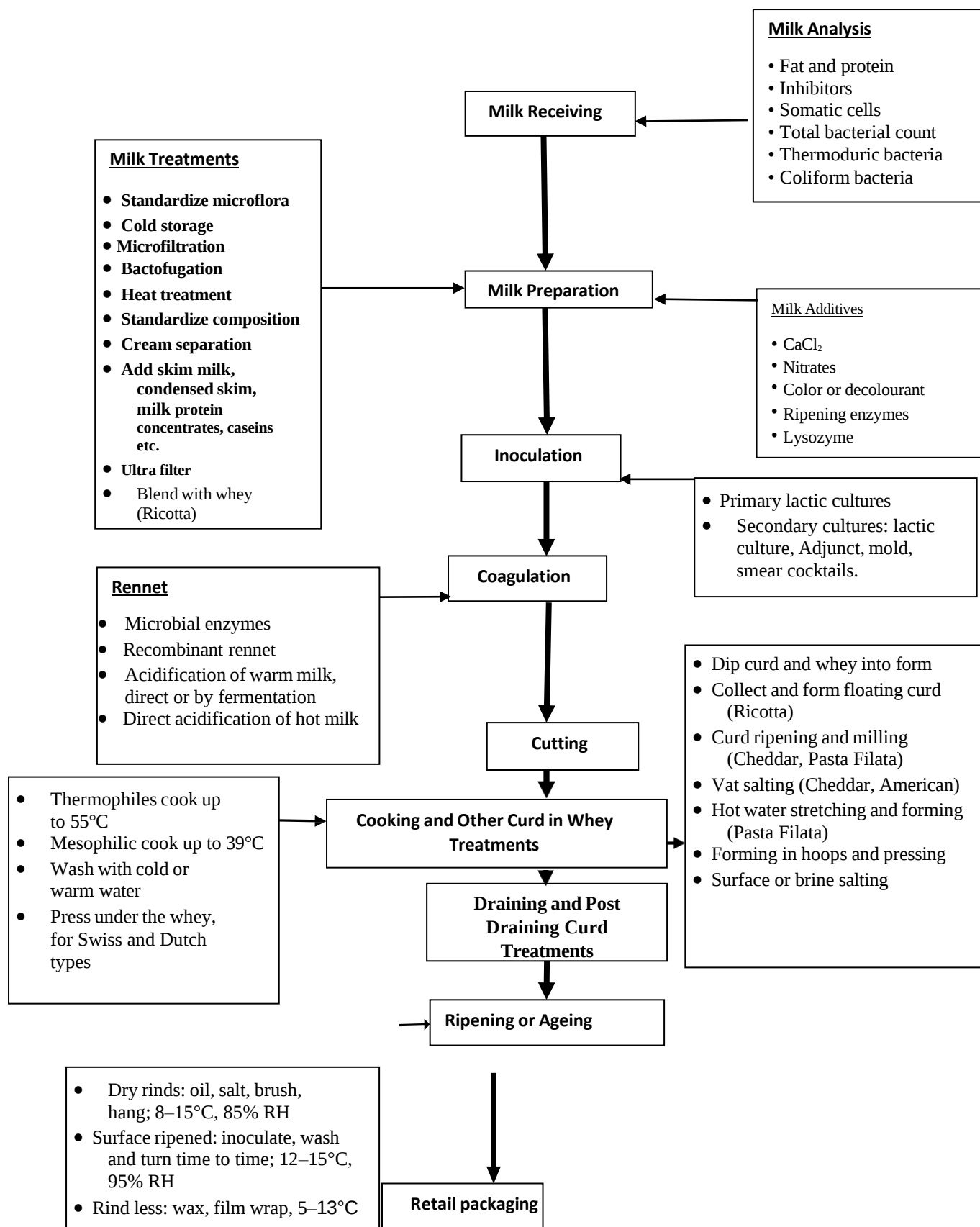


Figure 1. Flow chart of cheese manufacturing process (Source: Modified from Hill and Kethirddipalli.).

2.4.6 Composition of Yak Cheese

The composition of yak milk and five Nepalese cheeses were examined. Milk from pure-breed yak is golden yellow in colour with 7-10% fat, 19.3% total solids, 5.5% total protein, 0.8% β -lactoglobulin and 0.3% α -lactalbumin. Yak cheese produced at high altitudes (>2000 m) showed good organoleptic quality with a ripening index of 26.94. Yak cheese purchased at the DDC Head Office in Kathmandu was slightly rancid in flavor with a high ripening index (34.80). Protein content in yak cheese was more (36%) than Japanese gouda cheese (26.5%). Scanning electron microscopy of 120 day-old ripened yak, churpi and gouda cheeses showed distinct structural differences. Churpi had a highly compact structure with an accumulation of casein calcium phosphate crystals. Gouda cheese, with only a few calcium phosphate crystals, showed a more pronounced spongy structure of protein matrix than yak cheese (<https://doi.org/10.11465/milk.46.95>)

Table: 2.4 Nutritional composition of different types of cheese.

Per OZ (28 g)	Whole milk	Yak Cheese	Swiss	Swiss	Yak Cheese	Monterey, Jack	Ricotta, part-skim	Cheddar	Mozzarella, part-skim	Processed American (1 slice/2 1 gm	Blue
Energy	18.5	106	106			104	171	114	72	79	100
Moisture		38			38		-	-	-	-	
Protein (g)	0.92	43.6 (DB)	8.8		43.6 (DB)	7	14	7	7	5	
Fat (g)	1	45.8 (DB)	8		45 (DB)	8	10	9	4.5	7	
Calcium (mg)	33		224	224		209	37 ³	204	222	16 ¹	50
Phosphorus (mg)	26		161	161		124	227	145	131	108	110
Sodium (mg)	12		54	54		150	55 ¹	176	175	63 ²	95
Lactose (g)	1.4		0.02	0.02		0.14	0.38 ⁰	0.07	0.32	0.11 ⁰	.14
Salt (%)		1.87 (DB)			1.87 (DB)		-	-	-	-	

Source : *Importance and Introduction to Basic Technologies* Sharma Khanal, Pradhan & Bansal,; *J. Food Sci. Technol. Nepal*, Vol. 11 (14-24), 2019

2.4.7 Trend of Yak Cheese Production in Nepal

Yak cheese is the popular name for a cheese produced from yak and yak cattle-hybrid milk. These animals can exploit pastures from 6,000 to 18,000 ft. The first yak cheese factory was built in 1952 (Schulthess 1986). Yak cheese production began to use surplus milk after the Tibetan market was closed to Nepalese due to the Chinese invasion (Dubach 1986).

The Food and Agriculture Organization and Swiss cheese makers assisted in establishing the industry. Yak cheese factories are in remote high hill areas of Nepal. In the past it took from 2 to 4 days to transport cheese from these factories to Kathmandu. The primary market of yak cheese was foreign tourists and ex-patriots living in Nepal, but it is favourite to Nepalese consumers too. DDC yak cheese production started declining with the emergence of private yak cheese producers as DDC production fell from 79 tons in 1994 to 31 tons in 1996. At that time, private cheese production rose from 31 tons

in 1994 to 55 tons in 1996. The DDC had only allowed private production of yak cheese since the emergence of democracy and economic liberalization measures of the early 1990s. The DDC resisted permitting private yak cheese producers, but with the emergence of democracy entrepreneurs felt empowered and were able to overcome DDC objections.

There were altogether 20 Yak cheese (11 under Dairy Development Corporation and 9 under private sector) (Pande 1996). Total Yak cheese production was about 120 Mt in FY 2004/05. Based on the literature review, there were very few Yak Cheese producers in Nepal at present. However, small scale-chhurpi producers from cow milk are dispersed in different districts. The Yak Cheese production centres are concentrated mainly in Rasuwa district.



Nepal is the first country to produce cheese from yak/Chauri milk in the high alpine region of the country (T.B. Thapa, DSP/National Dairy Development Board, GPO Box 7445, Kathmandu, Nepal- Proceedings of the third international congress on yak held in Lhasa, P.R. China, 4–9 September 2000). This product has been popularly known as yak cheese. Nepal produced around 350 ton of cheese during 1998/99, out of which around 150 ton was from yak and Chauri milk.

A French cheesemaker and his team have put Nepal on the world cheese map, with their prize-winning Yak Blue. They did not just win a gold medal at the fourth Mondial du Fromage et des Produits Laitiers in France's Loire Valley. It was a Super Gold Medal that Francois Driard won for the [cheese from the mountains](#) of Ramechhap district- French cheese mela- [Sheilin Teo](#) June 11, 2019.

The situation is turned in U shape compared to 1998/99. Currently, the state-owned Dairy Development Corporation (DDC) has produced 33.9 tonnes of cheese and 11.7 tonnes of butter made from yak's milk from its plants located in four different locations in Rasuwa district ([Rss](#), 2021 Jul 08, 13:11, Rasuwa).

Table 2.5: Trend of yak cheese production in Nepal (Mt)

Industries	2021/22	2020/21	2019/2020	2018/19	2017/18	2016/17	2015/16	2014/15	2013/14	2012/13
DDC	33.75	34.17	62.78	56.58	52.78	49.73	49.22	50.32	44.62	46.39
Private	8.00	8.64	9.33	10.00	11.00	12.00	13.00	14.00	15.00	16.00
	41.75	42.81	72.11	66.58	63.78	61.73	62.22	64.32	59.62	62.39

Source: Field Survey 2022

The yak cheese production was 41.75 Mt in the year 2021/22 which was 64.32 Mt in 2014/15. The production is in declining trend (Ishwari Adhikari- Cheese Expert), "Production of yak cheese started declining after the 1980s. Now, many farmers have left their ancestral profession of yak farming."

Migration of people from the Himalayan region to hilly and Tarai region has impacted yak farming, "Yak farming is a very difficult profession. Farmers must tend their cattle round the clock and always look for grazing grounds. Now, many farmers have shifted to other easier jobs.

Stating that yak cheese has medicinal and nutritional benefits, it was to the government to introduce programs



and incentives for farmers to attract them toward yak farming. “Farmers are not getting good price for yak milk. Realizing this fact, the government should provide them financial and technical support.

Shyam Prasad Poudel (Livestock Export) said yak farming is declining despite of several efforts made by concerned government agencies. Despite lot of efforts for yak preservation, programs are not becoming much effective: “Decreasing number of yak farmers, failure to adopt new technology, and lack of programs to encourage farmers toward yak farming are some of the reasons behind this.” It was said that production of yak milk is not increasing as yak farmers are still following age-old farming methods and cost of production of yak milk is high and cannot compete with farmers rearing cow and buffalo which produce more milk. The government currently has only one yak farm at Syangboche of Solukhumbu for promoting yak farming in Nepal.

2.4.8 DDC's yak cheese gets organic certification

Yak cheese produced by District Development Corporation (DDC) has received organic certification from Organic Certification Nepal (OCN).

The certification was issued as per the national technical standards of Organic Agriculture Production and Processing System of Nepal 2064 (amended 2065) and OCN standard. OCN provided certification to DDC yak cheese amid an event organized in Kathmandu on Monday in the presence of representatives of OCN and DDC as well as the Ministry of Agriculture Development and the Ministry of Livestock Development.



2.5 Chhurpi production

The hard cheese, known locally as *chhurpi*, is made from milk collected from NAKS (female yaks), cows and CHAURIS (a cross between yaks and local hill cows). An excellent source of protein, people throughout the Himalayan region, including Tibet, Darjeeling and Sikkim, and Bhutan, love this hard-to-chew cheese. However, CHHURPI is now a favored food for dogs in the United States and Europe

2.5.1 Chhurpi production areas

Chhurpi is the dried hard casein product traditionally produced from yak or chauri (crossbred yak × chauri cattle) milk in the Himalayan region of Nepal, Sikkim, and Bhutan. Similarly, Serkam is a local dairy product, prepared by boiling and draining liquid portion of buttermilk and in some cases whey. The remaining solid is Serkam. It is used fresh or can be used after certain period, ranging between days to months. However, long storage causes natural fermentation, giving off typical flavour but is liked very much by Jirel and Sherpas. In China, excellent examples of diversification exist, including the processing of yak milk into powder

2.5.2 Chhurpi production in Nepal

Though Chhurpi production started in Nepal since long back, commercial production only started a decade past. The idea to market CHHURPIS as dog food came from brothers Suman and Sujan Shrestha who, together with Nishes Shrestha, started the company Himalayan Dog Chew in 2003. The idea was sparked when one of the brothers noticed a dog gnawing at chhurpi. In 2007, they launched their product at a pet fair in Bellingham, Washington. Since then, the company has come a long way: it is currently the largest exporter of Himalayan cheese out of Nepal, employing more than 9,000 people. In 2015, these three Nepali entrepreneurs appeared on the popular American TV show Shark Tank, even though they were already making over US \$5 million in sales a year.

Many other companies have since followed their lead, but Himalayan Dog Chew has now diversified, evolving from a single product-oriented business into a full pet supply company. According to its website, the company now proudly partners with a third-generation dairy farm in Washington State,



which produces 10 million pounds of milk per month and over 124 million pounds per year, all for Himalayan Pet Supply. Now the chhurpi production expanded in many districts from high hill to terai.

Total chhurpi production in Nepal in FY 2020/2021 was 1134.81 Mt. Based on the information collected from the chhurpi producers, a total of 532.98 Mt in province 1, 409.05 Mt in Bagmati, 89.1 mt in Lumbini, 87.48 Mt in Sudur Paschim and 16.2 Mt Chhurpi was produced in Gandaki province. This tangible quantity of chhurpi production may be due to reduce fluid milk market during COVID-19 period.

Table: 2.6 Estimated chhurpi production in Nepal

Provinces	Chhurpi (Mt)
Province 1	532.98
Bagmati Province	409.05
Gandaki Province	16.2
Lumbini Province	89.1
Sudurpaschim Province	87.48
Total	1134.81

Source: Field Survey 2022

Since this hard cheese is being exported to so many countries, including Canada, Germany, Hong Kong, India, Israel, Japan, Korea, Malaysia, Russia, Singapore, Taiwan, Thailand, United Arab Emirates, the United Kingdom and the United States, its manufacture has become a regular source of income for Nepal's rural farmers.

2.5.3 Chhurpi making technology

a. Yak Chhurpi

The commercial Chhurpi makers prepare the product in a batch using 169 litres of skimmed milk (SM) under local condition. The workflow of standardised process adopted by local *Chhurpi* maker in Nepal is described below.

Two hundred litres of milk (6.5% fat and 9% solid-not-fat) is separated to 31 litres of 40% fat cream and 169 litres, skimmed milk (SM). SM is heated to 60–65°C in aluminium kettle under direct fire. Then 40 litres of Dahi (fermented milk) made by using SM is added, with constant stirring. The curdled mass is cooked by boiling for 30 minutes or until long threads or chains are formed. Then 50–60 litres of whey drawn out. The kettle is taken out of fire after colour changes to creamy yellowish.

The cooked curd is strained and pressed for 24 hours using stone weights. The pressed curd is cut into small cubes and air-dried on a bamboo mat in a well-ventilated room. The product is hard enough after 12–15 days of air-drying. Alternatively, the product is smoke-dried after 10 days of air-drying. Chhurpi yield is 4.5% with 8–10% moisture, 8–9% fat and 80% protein on dry matter basis. The technology has been very useful to the remote and mountainous milk producers who do not have

access to raw milk market. The producers are able to convert perishable milk into long life products like Chhurpi, butter and ghee. The technology has been quite useful to generate cash income and local employment at the rural level. Further work is needed to improve the quality and the profitability of final product and to improve the technology appropriate to the rural producers.

Currently, chhurpi from cow milk is being produced as export item in the name/tag of dog chew. Tangible quantity of dog chew has been produced and exported that contain 0-1.5 percent fat. None of the producers are open eyes to produce chhurpi for human consumption using the method mentioned above. This item may contain more fat and use for human consumption as chew item. It is thus required to search international market for it.

b. Dog Chew

The Dog chew makers collect yak/cow milk through direct relationships with farmers and sometimes with Milk Producers Cooperatives (MPCs).

While manufacturing the chews. Milk is boiled in 212-degree Fahrenheit for 45 minutes to one hour, then cream separation done and remove all the fat from the milk. The remaining milk is used to make the dog chew. Then the milk left for cools down and add whey coagulate the milk. The mixture needs to be boiled to make a cheese formation. Then the whey is discarded, and cheese is separated. The cheese needs to be compressed for drying process as chhurpi is very delicate product and produce fungus under inappropriate storage condition, this problem is facing by the entrepreneurs



The cheese is wrapped inside a burlap bag and press to squeeze all the moisture out of the cheese. The wrapped cheese should be dried for 15–20 days to make it solid hard. After the drying is done, the solid hard chews keep in the smoking chamber to give the chews a smoky flavor.

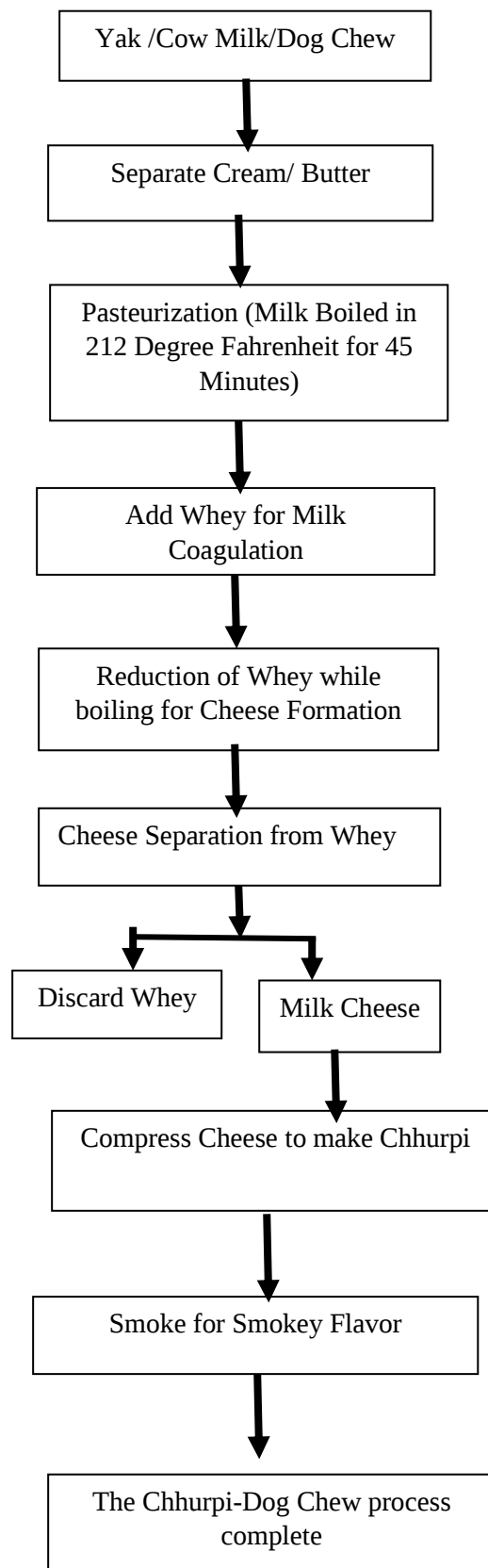
At present the farmers themselves farmers are well trained in the manufacturing of the chews with 100 % customer satisfaction. The farmers then transport the cake chew for further processing to chhurpi processors.

Processing of the Product

When the chews are completely dried, they are then transported to private processing unit in where processing units are established and stored in order to maintain good quality. Depending on the demand/ order of the product, some processing unit clean the chews using lime juice, salt with buffing machine while some processing also clean it soaking in the tea solution. The chew cakes then cut the chews in different available sizes according to the customer's demand and orders. Then with attractive package, the chew packed and ship the USA, Japan, Canada and other many countries. They also sell the chews to the re-sellers of Nepal.



Fig: 2 Dog Chew Production Technology in Nepal



The Cheese production is mainly concentrated in Province 1, Bagmati and Gandaki province while Chhurpi production is being practiced in all provinces except Madhes province in Nepal.

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Mostly cheese productions in Nepal are Ilam, Panchthar, Taplejung, Dolkha, Ramechhap, Rasuwa and Mustang districts. While chhurpi production is being doing in almost all of the district of province a and Bagmati Pradesh. Baglung, Myagdi, Manang, Mustang in Gandarki, Surkhet in Karnali and Kailali, Kanchanpur and Dadeldhura districts in Sudur Paschim Province.

2.5.5 Estimated milk volume used, and products produced (Cheese and Chhurpi) annually at industry and household/farm level

Yak Cheese is mainly produced in Bagmati province specially concentrated in Rasuwa district. Very small quantity is being produced in Ramechhap and Dolkha districts as farm level business. Total volume of cheese production in FY 2020/21 was 528.04 Mt. Total Kanchan Cheese produced was 486.29 Mt while yak cheese was only 41.75 Mt. The milk use for cheese production is presented in annex: 4.

Table: 2.7 Volume of milk used for Cheese Production

Provinces	Cheese	Annual Milk (Lits)	Cheese Mt
Province 1	Kanchan DDC	280045.5	27.17
Province 1	Kanchan Private	5058000	453.42
Bagmati Province	Kanchan	232875.14	5.70
Bagmati Province	Yak DDC	341702.7	33.75
Bagmati Province	Yak Private	8000	8.00
Total		5920623	528.04

Source: Field Survey 2022

Yak and cow milk is the raw material for making cheese and chhurpi. Since last two decades after the opening of foreign employment and political conflict, many youths started to go abroad for job seeking. Due to this reason, the Yak milk production is severely affected. This ToR scoped to take status of farmers and small sample was determined to get current status of farmers. The result of the survey is briefly analysed as follows:

2.5.6 Number of farmers interviewed

Twenty-three districts including nine each in province 1 and Bagmati province, three districts from Bagmati and two districts from Lumbini province were covered in sample. A total of 84 farmers out of which thirty-two each farmer from province 1 and Bagmati province, 12 from Gandaki and 8 from Lumbini province were interviewed. Total cow, buffalo and yak/chaury farmers were 40, 36 and 8 respectively.

Table 2.8 Number of farmers interviewed

Districts/ Animal	Province 1	Bagmati	Gandaki	Lumbini	Total
	9	9	3	2	23
Cow	15	15	6	4	40
Buffalo	14	13	5	4	36
Yak/Chauri	3	4	1	0	8
Total	32	32	12	8	84

Source: Field Survey 2022

2.5.7 No of dairy animals in the farm

There were 397 dairy animals farmed in 84 farmers. Total number of cows, buffaloes and yak/cahuri were 125, 93 and 197 while average herd size were 3.1, 2.6 and 22.4 respectively.

Table: 2.9 No of dairy animals in the farm

Animals	Province 1	Bagmati	Gandaki	Lumbini	Total
Cow	51	41	19	14	125
Buffalo	36	26	18	13	93
Yak/Chauri	75	87	17	0	179
Total	162	154	54	27	397

Source: Field Survey 2022

2.5.8 No of milking dairy animals in the farm

Out of 397 dairy animals in the farm, 133 were at active lactation. While calculating the percentage in an average 33.5 percent dairy animals were milking, by animal type 34.4 percent cow, 38.7 percent buffalo and 30.2 percent yak/cahuri were in active lactation.

Table: 2.10 No of milking dairy animals in the farm

Animals	Province 1	Bagmati	Gandaki	Lumbini	Total	Percent
Cow	18	14	6	5	43	34.4
Buffalo	14	10	7	5	36	38.7
Yak/Chauri	23	25	5	0	54	30.2
Total	55	49	18	10	133	33.5

Source: Field Survey 2022

2.5.9 Local dairy animals in the farm

As responded by the respondents, out of total 397 dairy animals in the survey HHs, 16.39 percent dairy animals were local breed. Among them 21.25 percent were buffaloes, 71.91 percent were yak/cauri and 10.61 percent were cows.

Table: 2.11 Local dairy animals in the farm

Animals	Province 1	Bagmati	Gandaki	Lumbini	Total	Percent
Cow	6	2	3	2	13	10.61
Buffalo	5	8	2	5	20	21.25
Yak/Chauri	11	17	3	0	32	17.91
Total	22	28	9	7	65	16.39

Source: Field Survey 2022

2.5.10 Improve dairy animals in the farm

Improved breed dairy animals were found very less in the surveyed HHs. Only 1.76 percent dairy animal's breeds were improved breed. Out of them cows were 1.007 and buffaloes were 0.75 percent whereas no improved yak/cahuri were found in the surveyed HHs.

Table: 2.12 Improve dairy animals in the farm

Animals	Province 1	Bagmati	Gandaki	Lumbini	Total	Percent
Cow	1	1	1	0	4	1.007
Buffalo	1	2	1	0	3	0.75
Yak/Chauri	0	0	0	0	0	0.00
Total	2	3	2	1	7	1.75

Source: Field Survey 2022

2.5.11 Cross dairy animals in the farm

Cross breed dairy animals predominate the surveyed HHs. It was found that a total of 81.86 percent dairy animals were cross breed. Out of them 85.98 percent were cows, 82.09 percent were yak/chaury and 75.53 percent were buffaloes. It indicated that, farmers preferred to farm cross breed dairy animals.

Table: 2.13 Cross dairy animals in the farm

Animals	Province 1	Bagmati	Gandaki	Lumbini	Total	Percent
Cow	44	37	15	11	107	85.98
Buffalo	31	17	15	8	70	75.53
Yak/Chauri	64	70	14	0	147	82.09
Total	139	123	44	19	325	81.86
Grand Total	162	154	54	27	397	100

Source: Field Survey 2022

2.5.12 Annual milk production per cow per lactation

The annual milk production of dairy animals is in increasing trend. The average milk production per cow per lactation was 2319.62 liter while it was 2038.92 liter five years back and 1933.21 liter 10 years back. Hence, cow milk productivity has been increased significantly i.e. 19.98 percent in ten-year period.

Table: 2.14 Annual milk production per cow per lactation

Period	Province 1	Bagmati	Gandaki	Lumbini	Average
Current	2317.56	2341.75	2304.96	2314.2	2319.62
5 years back	2021.88	2095.25	2018.4	2020.14	2038.92
10 years back	1914.87	1965.04	1935.46	1917.48	1933.21

Source: Field Survey 2022

2.5.13 Annual milk production per buffalo per lactation

The average milk production per buffalo per lactation is 1825.6 liter while it was 1763.2 liter five years back and 1705.2 liter 10 years back. It clearly identified that that buffalo milk productivity has been increased by 7 percent in ten-year period. The milk productivity of buffalo hence found increased less than cow.

Table: 2.15 Annual milk production per buffalo per lactation

Period	Province 1	Bagmati	Gandaki	Lumbini
Current	1881.6	1902.69	1814.4	1825.6
5 years back	1805.25	1856	1808.73	1763.2
10 years back	1725.5	1745.8	1729.56	1705.2

Source: Field Survey 2022

2.5.14 Annual milk production by a dairy Yak/Chauri

The average milk production per yak/chaury per lactation is 237.4 liter while it was 276.1 liter five years back and 278.4 liter 10 years back. It clearly mentioned that cow milk productivity has been decreased by -6.34 percent in ten-year period. The reasons for decrease in milk production are among others lack of interest in yak/chaury farming among the new generation farmers, deteriorating the pasture/grazing land, poor breeding services and impractical Act on disposal of yak/chaury.

Table: 2.16 Annual milk production per Yak/Chauri per lactation

Period	Province 1	Bagmati	Gandaki	Lumbini
Current	261.0	281.0	250.6	237.4
5 years back	268.6	273.2	272.5	276.1
10 years back	262.8	287.1	271.4	278.4

Source: Field Survey 2022

2.5.15 Use of Cow Milk (Calculated at per dairy animal per lactation)

It was found that, farmers prefer to sale the milk and they have facility to sale. As responded by the respondents, 88.42 percent cow farmers sale their milk while 11.48 percent cow farmers milk used for HH consumption and negligible quantity i.e 0.11 percent cow milk farmers share to neighbour, old age people and sick and relatives.

Table: 2.17 Use of Cow Milk (Calculated at per dairy animal per lactation)

Uses	Province 1	Bagmati	Gandaki	Lumbini	Total	Percent
Sale	2039.45	2077.13	2027.21	2059.64	8203.44	88.42
HH consumption	273.47	262.51	274.29	254.56	1064.83	11.48
Share	3.62	2.34	3.62	0.23	9.81	0.11
Total	2316.54	2341.98	2305.12	2314.43	9278.08	100.00

Source: Field Survey 2022

2.5.16 Use of Buffalo Milk (Calculated at per dairy animal per lactation)

From the survey, it was found that, 92.52 percent milk produced from the buffalo has been sold, 7.35 percent used for HH consumption and only 0.13 percent is share to neighbours who are old age, sick or children.

Table: 2.18 Use of Buffalo Milk (Calculated at per dairy animal per lactation)

Uses	Province 1	Bagmati	Gandaki	Lumbini	Total	Percent
Sale	1712.26	1807.56	1632.96	1716.06	6868.84	92.52
HH consumption	169.34	95.13	176.00	105.34	545.81	7.35
Share			5.26	4.20	9.46	0.13
Total	1881.60	1902.69	1814.22	1825.60	7424.11	100.00

Source: Field Survey 2022

2.5.17 Use of Yak/Chauri Milk (Calculated at per dairy animal per lactation)

As responded by the respondents, 57.81 percent milk from Yak/cahuri sold the milk while 23.27 percent use for HH consumption and 18.92 percent share the milk to relatives, neighbours.

Table: 2.19 Use of Yak/Chauri Milk (Calculated at per dairy animal per lactation)

Uses	Province 1	Bagmati	Gandaki	Lumbini	Total	Percent
Sale	174.61	155.71	128.07	0.00	458.39	57.81
HH consumption	32.24	72.12	80.11	0.00	184.47	23.27
Share	54.03	53.39	42.60	0.00	150.02	18.92
Total	260.87	281.22	250.78	0.00	792.87	100.00

Source: Field Survey 2022

2.5.18 Use of milk aggregate (Calculated at per dairy animal per lactation)

Mostly the milk has been sold to the market by the farmers. From the survey it was found that 88.77 percent milk is being sold, while 10.26 percent used for HH consumption and nearly 1 percent share the milk to neighbours or relatives.

Table: 2.20 Use of milk aggregate (Calculated at per dairy animal per lactation)

Uses	Province 1	Bagmati	Gandaki	Lumbini	Total	Percent
Sale	3926.316	4040.4	3788.24	3775.702	15530.66	88.77
HH consumption	475.0513	429.7642	530.3973	359.8991	1795.112	10.26
Share	57.64239	55.73365	51.47779	4.4303	169.2841	0.97
Total	4459.01	4525.898	4370.115	4140.031	17495.05	100.00

Source: Field Survey 2022

2.5.19 Place of milk sales

Place of milk sale by the farmers was predominated by dairy industries which as 80.2 percent milk was sold to dairy industries, followed by 8.61 percent farmers sold to Cheese factories, 6.68 percent to chhurpi producers, 3.6 percent sold to local market and 0.82 percent farmers sold visiting door to door. It was found that tangible amount of milk is being used for making Chhurpi.

Table: 2.21 Place of milk sales

Milk market	Province 1	Bagmati	Gandaki	Lumbini	Total	Percent
Door to Door	31.41053	24.2424	34.09416	37.75702	127.5041	0.82
Local market	39.26316	80.80801	170.4708	268.0748	558.6168	3.60
Chhurpi producer	471.158	525.252	37.8824	3.775702	1038.068	6.68
Cheese Producers	1060.105	202.02	75.7648	0	1337.89	8.61
Other dairy industry	2324.379	3208.078	3470.028	3466.094	12468.58	80.28
Total	3926.316	4040.4	3788.24	3775.702	15530.66	100.00

Source: Field Survey 2022

2.5.20 Expenditure on milk production

Annual expenditure on four cows, buffaloes and Yak/chaury was NRs. 336000, NRs. 347000, NRs. 130000 respectively. In percent it was calculated at 41.33 percent, 42.68 percent and 15.99 percent respectively. Thus, more expenditure was to buffalo and least was for Yak/chaury.

Table: 2.22 Expenditure on milk production

Animals	Province 1	Bagmati	Gandaki	Lumbini	Total	Percent
Cow	81000	84000	86000	85000	336000	41.33
Buffalo	85000	86000	88000	88000	347000	42.68
Yak/Chauri	43000	45000	42000	0	130000	15.99
Total	209000	215000	216000	173000	813000	100.00

Source: Field Survey 2022

2.5.21 Income on milk production

Total income per four cow per lactation was NRs. 508456.5, buffalo was NRs. 433336 and Yak/Chauri was NRs. 99273.72. Out of total Income 48.84 percent was from cow, where that of buffalo was 41.62 percent and Yak/Chauri was 9.54 percent. Thus, more income was found from cow and least from Yak/chaury.

Table: 2.23 Income on milk production

Animals	Province 1	Bagmati	Gandaki	Lumbini	Total	Percent
Cow	125148.2	128796.3	127925.3	126586.7	508456.5	48.84
Buffalo	109132.8	110356	107049.6	106797.6	433336	41.62
Yak/Chauri	33669	34283.22	31321.5	0	99273.72	9.54
Total	267950	273435.5	266296.4	233384.3	1041066	100.00

Source: Field Survey 2022

2.5.22 Profit margin per dairy animal rearing

Profit margin per dairy animals is varied from animal type. Based on the responses from respondents, cows are more profitable than buffalo but, rearing yak/chaury is not profitable. According to the farmers, if, Act for disposing the unproductive yak/chaury is reformed or equal norms in ever district (according to the farmers from Dolkha, Ramechhap, in Mangag and Mustang slaughter of Yak/chaury is legal while illegal in their districts).

Table: 2.24 Profit margin per dairy animals rearing

Animals	Province 1	Bagmati	Gandaki	Lumbini	Total
Cow	44148.24	44796.25	41925.28	41586.74	172456.5
Buffalo	24132.8	24356.02	19049.6	18797.6	86336.02
Yak/Chauri	-9331	-10716.8	-10678.5	0	-30726.3

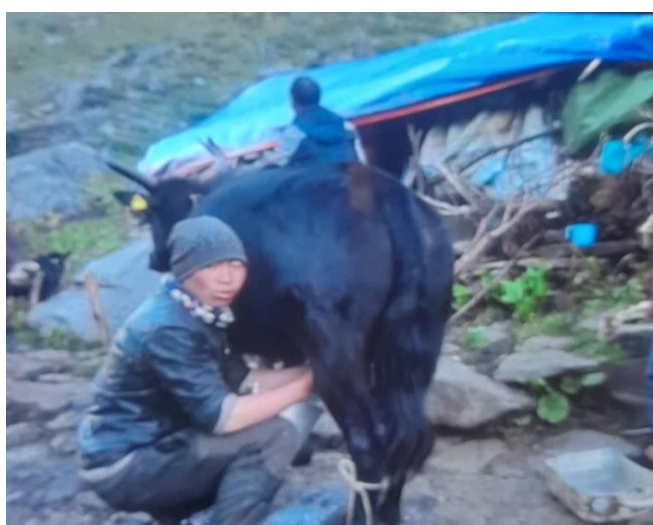
Source: Field Survey 2022

According to Key Informants and FGD participants, Yak farming is least priority of new farmers of high and mid hills of Nepal. Therefore, Yak milk production is declining trend implicating same trend in Yak Cheese production. He argued that cheese and chhurpi making is possible only when the Yak/Chauri population increased, and it required to have appropriate breeding plan for increasing Yak

and Chauri Population increased as Chauri calve annually. Other problem associated to it is, gradually deterioration in in pasture/ grazing land in the high hill, chauri farmers are displacing due to poor income from the chauri. Milk production is very low which is associated with poor yak breed, disease prevalence, poor vaccination, inadequate extension services, financing, poor animal management, less care on animal welfare, difficulties in animal identification, poor animal health recording system, poor housing management and water for feeding the animals. On the other hand, having good market price for Yak cheese, and chhurpi production is economically viable as these products have huge demand in Europe and America.

It is also said that Yak farming can be integrated with tourism establishing of Yak Circuit along the Himalayan region from Bhutan in the east and Pakistan in the west. Nepal situating in the middle could benefited more expanding Yak farms at different strategic senary areas to add value. In Kalinchowk area there are 11 Goths and in Bhimeshwar Area 3 Goth, but milk production is very low.

Being migratory obligation created by the climate in Himalayan region, Yak/Chauri move from one place to other at every 2 months interval namely Fagun and Chait, Baisakh and Jestha, Asar and Shrawan, Bhadra and Aswin, Kartik and Magsir and Push and Magh from high altitude to Low. Normally yak/chauri calved on Asar/shrawan. In such circumstances, it is required to make sheds at such strategic location where Chauri/Yak stationed for two months period (2500-to-2600-meter height).



Currently, the Sherpas at high hill and mountain region are suffering health problem specially the women health during delivery time and also faced severe problem of fetching water as most of the water sources are drying due to climate change.

2.5.23 Volume of milk used for chhurpi production

In the last fiscal year 2077/78, tangible quantity of milk was found used in making chhurpi. As responded by the chhurpi makers and farmers 73700-liter milk per day totaling annual milk 25218000 liter was used in chhurpi production which is 7 percent of the total formal sector milk collection. The district-wise estimated milk used, and chhurpi production is presented in Annex: 5

Table: 2.25 Volume of milk used for Chhurpi Production

Provinces	Daily Milk (Lits)	Annual Milk (Lits)
Province 1	35800	11844000
Bagmati Province	26000	9090000
Gandaki Province	1000	360000
Lumbini Province	5500	1980000
Sudurpaschim Province	5400	1944000
Total	73700	25218000

Source: Field Survey 2022

The large volume of milk used in chhurpi production may be due to COVID-19 when consumption of fluid milk reduced, and farmers seek alternative market. Moreover, this is good indication that, milk becomes a source of foreign currency and contributed to minimizing the trade deficit.

2.5.24 Cheese/Chhurpi value chain

Both backward and forward value chain is important for cheese/chhurpi production and marketing. Backward value chain actors are described as follows:

Table 2.26 : Cheese/chhurpi value chain actors, their functions and inters relationships

SN	Actors	Function	Relationship
A	Production chain		
1	Agro-vets	Supply veterinary medicine, fodder/forage seed/ saplings Provide technical services to some extents Provide counseling services to the farmers Supply feeds and dairy utensils	Service and input provision and make available to the dairy farmers
2	Nurseries	Produce fodder saplings	Provide fodder saplings
3	Universities and technical institutes and universities	Produce different level manpower to be worked in the dairy subsector Provide skill training Undertake research on different actors in value chain	Produce high level, middle and low level human resource Provide tailored made courses on dairy production and management and processing
4	Resource center	Produce required number of quality yak/cow Maintain the gene pool for breeding purpose Assure breed type and genetic purity	Provision of the high producing quality dairy animal breed
5	Banks and financial institutions	Provide loan to the dairy entrepreneurs (farms and other value chain actors) based on their business plan Follow the rules as administered by the central bank and Government of Nepal	Review on the business and offer loan
6	Insurance companies	Ensure the dairy farms/ farm animals lying within the policy administered by the government and the <i>Beema Samiti</i> . Train the people on insurance agent and extension services to the livestock production areas Coordinate with bank, dairy extension service providers and evaluate the insurance claim and provide claim without any delay	Loss mapping and provide insurance claim as soon as possible
7	Feed factories	Produce cattle feed Supply feed to the retailers/ dealers	Offer dealership to the local feed suppliers and supply the feed as per demand
8	Dairy equipment suppliers	Supply dairy equipment and machineries Supply utensils and apparatus Supply dairy chemicals	Supply the dairy equipment, utensils and chemicals to the dairy farmers, MPCs, milk collectors
9	Farmers groups	Organize the farmers Saving and credit Resource pooling from different sectors Service delivery to the members	Organizing the farmers, resource pooling and service delivery to the members
10	Dairy farmers/Farms	Dairy farm operation/ manage dairy animals Produce milk and supply to the milk collectors (MPC/ private vendors, consumers)	Produce milk using the inputs (forage seed/saplings, forage/fodder, medicine, live animal, technical support and others)
B	Marketing chain		
11	Milk Producers Cooperatives (MPC)/ Cooperatives	Unite the dairy farmers Quality checking of the milk (CoB and fat, Sand Solid Not Fat (SNF)	Collect and provide the milk to the milk processing industries/ chilling centers, milk vendors. Offer inputs

SN	Actors	Function	Relationship
		Act as milk collection center and collect, chill storage and handover to the milk transporter Sale milk to the milk processing industries and their chilling facilities Chill the milk and provide to the milk processors Sale milk to the local market Provide dairy inputs (feed, forage seed/saplings medicine, dairy utensils etc) to the members	and services to the dairy farmers. Establish linkage between dairy farmers and the milk processors.
12	Cheese/chhurpi producers	Received the milk from the milk tanker/transport Quality check for chemical quality (Fat, SNF, TS, protein), bacterial quality (Total Plate Count-TPC, coliforms, antibiotics and others). Standardize the milk (cream separation etc) Produce value added products (product diversification) Supply to the milk distributors/ dealers	Establish linkage between the chilling center- transport, dealers and maintain cold chain. Produce milk and milk products as per choices of the consumers
13	DFTQC	Quality check/ testing for different food variables Provide quality test report to the producer/exporter	Certify the quality of the cheese/chhurpi
14	DLS	Test the products for zoonotic and other diseases as requested by the cheese/chhurpi producer/exporter Provide quality test report to the producer/exporter	Provide Health or Sanitary Certificate to the cheese/chhurpi exporter
15	Trade Promotion Center (TPC)	Coordinate and support for exporting the cheese/chhurpi Support for trading	Establish linkage with producers-traders-export
18	DOI	Provide trademark and ascertain logo Facilitate for export of cheese/chhurpi	Certification of trademark, logo and collective mark
19	Commercial bank	Open bank account in foreign currency Open LC	Guarantee of payment to the international parties
20	Dealers (domestick/international)	Take cheese/chhurpi from factories Maintain cold chain Supply cheese/chhurpi to the retailers	Maintain cold chain and link the processing industries and retailers
21	Retailers (domestick/international)	Store the milk safely Cheese/chhurpi to the consumers (institutional and households)	Maintain cold chain and link between the consumers, dealers and processing industries
22	Domestic /international consumers	Purchase the cheese/chhurpi Provide feedback through the retails to the cheese/chhurpi processors Alert on the consumer right and raise voices for quality assurance	Pay against quality

Source: Field Survey 2022

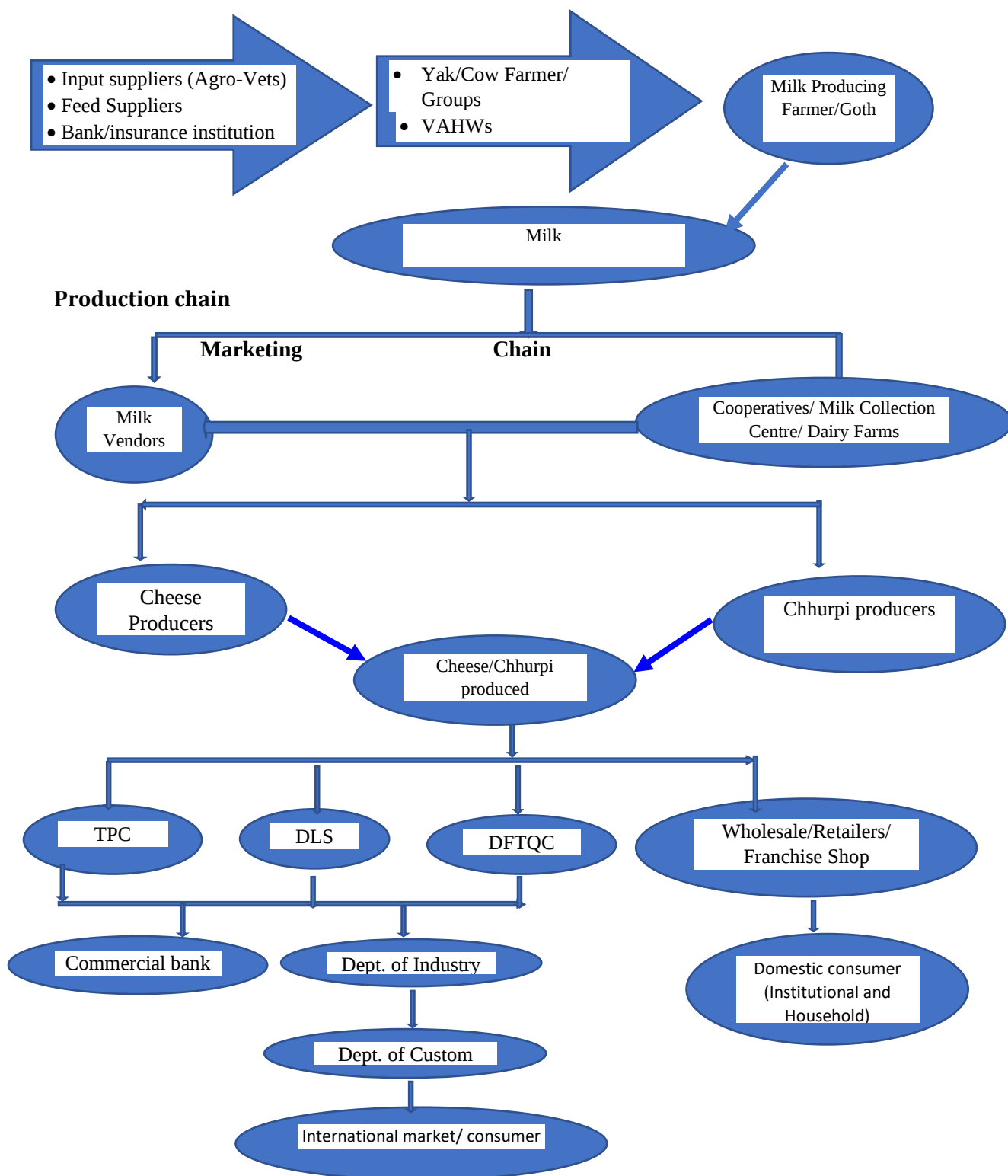


Fig: 3 Cheese/Chhurpi Value chain

2.5.25 Gaps hurdling the trade in yak cheese production

a. Backward chain

Still yak/chaury husbandry is traditional type in Nepal and population of yak/chaury is also decreasing in recent years. Scarcity of drinking water, poor veterinary service, less interest of youth towards farming, less awareness of famer, predation from wild animal and heavy snow fall are major problems in yak/chaury farming in Nepal. From very early times, yak herding, breeding and management have become an important part of traditional cultures, religions and social life in the Himalayan region, with several ethnic communities and tribes highly dependent on yak for their day-to-day activities, livelihood options and tourism. Yak/chaury production can continue to be one of the major means of supporting pastoralists in the high-altitude areas of the Himalayan region. Thus, there is a need to improve yak/chaury production, conserve yak genetic diversity and traditional breed selection systems and improve the livelihoods of yak herders.

In context of Nepal improving the awareness level of farmer is essential for improving yak/chaury husbandry. Availability of veterinary service, establishment of pasture bank and regular water supply is vital. Use of regular deworming, vaccination and mineral supplement to yak/chauries is needed for improving production and productivity. For breed improvement, introducing superior breed from other places (China/Tibet) along with start of artificial insemination program with semen of superior genetic value will be helpful. Strengthening capacity of yak research centre and yak resource centres in the country has become crucial. Animal insurance policy, animal welfare should be implemented to minimize possible risk due to loss from predators, snow fall and diseases. For improving marketing facility, establishing more factory related to yak/chaury products in high altitudes recommended.

Forward chain

There are three problems for private yak cheese producers stemming from institutional constraints that are readily apparent. The problems include: (1) sub-optimal product quality, (2) sub-optimal firm organization and (3) the inability of private producers to pool resources for generic advertising (Colavito 1994).

The impact of failure to advertise is not estimated due to data constraints. The material related to advertising is presented in this section to establish the pervasive nature of a variety of institutional constraints in Nepal.

Yak cheese factories experience high variation in product quality and are distant from Kathmandu. These factors make factory inspection by retailers impossible. Typically, businesses in Nepal that gain a reputation almost invariably exploit this reputation for short-term gain. There are three major observable impacts from sub-optimal quality cheese production on the industry. There is a wholesale price gap between DDC and private cheese. Also due to short shelf-life wholesalers buy only limited amounts of private cheese per transaction which forces producers to make numerous costly marketing trips. Retailers charge the same price for DDC and private cheese.

The inability of wholesalers to detect cheese quality at the time of purchase would favor a vertically integrated firm like the DDC. The DDC produces and markets cheese from a permanent facility in Kathmandu. A vertically integrated firm produces cheese of optimal quality because it has perfect

information about the quality of the cheese it produces. However, it is extremely difficult and costly for private firms to manage operations in distant locations due to the cost of monitoring hired labor. The extreme remoteness of the areas where yak cheese is produced compounds the monitoring problem because firm owners and family members are unwilling to live and travel to these areas. A vertically integrated firm that produced optimal cheese quality would also be able to reduce its marketing costs. Such a firm would be able to transport cheese in larger shipments since it knows that the cheese would not spoil in storage.

The market failure for cheese quality also results in under investment in cheese factories by private firms. DDC-type factories are needed to produce good quality cheese. The DDC maintains a permanent central factory to staff qualified staff, produce butter, store cheese, store and maintain equipment. However, private cheese producers cannot justify such investment since they receive the price for only the average quality of cheese. The limited investment by private cheese producers in equipment to produce quality cheese resulted in erratic progress toward market privatization and may presage future industry decline. The private firms are unable to provide quality housing for qualified master cheese producers.

In the context of increasing trend in chhurpi export, quality control and branding are utmost important. Similarly, there is no Standard Operating Procedure (SOP), Good Manufacturing Practice (GMP), Code of Conduct (CoC), Code of Practice (CoP) for chhurpi manufacturing chhurpi. Until now, it is being exported as 'Dog Chew' and exporting haphazardly. Trademark, brand name, branding, packaging and promotional activities are also not appropriately done. Regularizing the production and marketing of chhurpi could be instrumental to contribute to earn foreign currency. Primary level of processing is being done at village level collecting minimal quantity of milk it could reduce the transportation cost, chilling cost and milk storage facility. Thus, this business could expand its arms at different nooks and corner of the country and become good means for self-employment in rural area integrating chhurpi and tourism.

Being a member country of WTO, SAARC, OIE, SPA, Codex BIMSTEC etc, it is essential FMD free certification to export. Until the date, the other member countries allow to export without FMD free certification, it may be due to the product for dog. They may ask this certificate if we tried to export chew for human purpose or even for dog chew too as the volume of export increased. Exercise for zoning the country, extensive vaccination program in selected zone and certification for FMD free in close coordination with above mentioned international institutions is felt urgent.

The cheese/producers are to be visited many government institutions in the course of taking trademark and licencing for export. Taking phyto-chemical test, disease pathogen test, trade promotion, technical support, tax, company registration and others. To make the process easy one door approach could be meaningful to promoting export.

It is very difficult to establish database of the product produced, milk used, domestic consumption and export of yak cheese and chhurpi. The code language for export of chhurpi mentioned in Nepal Foreign Trade Statistics is not clear to the readers. Data generation could be effective when it is generated by respective producers and provide to concern government agency. NDDB could be an institution to coordinate with producers, concern government line agencies and Nepal Foreign Trade Statistics division to establish database.

2.5.26 Need for capacity building (logistics/human resource) for quality assurance

Human resource development and training facilities, yak milk processing industry association and marketing and promotion are the major issues to be addressed to promote the yak cheese and chhurpi

trade. The time has come to strengthen the capacity of Yak Research Centre that could carry out the research, education and training, development of appropriate technology, standardisation of products and processes, and other areas identified by the yak-producing countries. Diversification is very essential to generate sustainable income, and it is only possible when proper practical training and technology is transferred to the farmers and entrepreneurs.

In the context of increasing trend in chhurpi export, quality control and branding are utmost important. Similarly, standard SOP for manufacturing chhurpi is to be prepared, code of conduct, good manufacturing practices and market promotion integration to tourism.

Short term training on improving yak/chaury husbandry, veterinary service, establishment of pasture bank and regular water supply is vital is required. Similarly, functional training on deworming, vaccination and mineral supplement to yak/chauries is needed. For breed improvement, Artificial Insemination (AI), semen collection, storage, need of insurance of the Yak/chaury to minimize possible risk due to loss from predators, snow fall and diseases, and business plan support is also required.

2.5.27 Viable business plan for yak cheese and chhurpi

The business plan has been prepared based on the information provided by the yak cheese and chhurpi producers in real practice. Assuming 1.5 percent fat in chhurpi and 4.5 percent fat and 8.1 percent SNF in cow milk and 5.5 percent fat and 8.1 percent SNF in Yak/Chauri milk. Chhurpi yield 4.7 percent yield and Cheese yield 10 percent. Considering the productivity of yak/chaury and current level of chhurpi production by an entrepreneur, small scale business is in operation. Hence, the plan is prepared for processing 500-liter milk per day for both yak cheese and chhurpi producers. Chhurpi production shall be done in all ecological region while yak cheese only in high hill and business plan is prepared for remote rural area of concern ecological regions. The detail business plan is presented in annex: 1.

CHAPTER-3

MARKET AND IMPORT AND EXPORT OF YAK CHEESE AND CHHURPI

3.1 Key market segment in outside country

Market players are categorised depending on the market segment. Cheese market by source (cow milk, sheep milk, goat milk, and buffalo milk), type (natural cheese, hard cheese, soft cheese, processed cheese, spreadable cheese, and block cheese), product (mozzarella cheddar, feta, parmesan, roquefort, and others), and distribution channel.

The cheese market size was valued at \$156.9 billion in 2020, and is estimated to reach \$199.7 billion by 2030, registering a Compound Annual Growth Rate (CAGR) of 2.3% from 2021 to 2030. Global Cheese Market is expected to reach \$ 199.7 Billion by 2030 growing at 2.3% (2021-2030). Cheese Market Size, Share & Growth. Global forecast -2030 <https://www.alliedmarketresearch.com › cheese-market>

Cheese consumes about one-tenth volume of milk, making it portable with longer shelf life compared to milk. It is rich in nutrients such as protein, essential minerals, fat, calcium, and others. When compared to whole milk (3-4% protein and fat), it contains 30-40% protein and fat along with other minerals and fat-soluble vitamins. Moreover, it offers certain health benefits such as stronger teeth & bones, healthy heart (if consumed in moderate quantity), prevention of osteoporosis, and others. Furthermore, cheddar, parmesan, Roquefort, and others can be easily consumed by lactose intolerant and milk allergic people. The distinction between texture and taste is determined by the raw material such as type & breed of milk producing animal, grazing and climatic factors taken into consideration during the preparation of cheese.

In 2020, North America and Europe collectively occupied with nearly 77% of the **cheese market** share. At present, the global cheese market growth is driven rise in number of quick service restaurants (QSRs) in the developing regions and already established QSR outlets in the developed regions. In addition, longer shelf life of cheese products, rise in disposable income, and increase in demand for protein-rich food propel the market growth. However, alarming obesity rates & rise in health consciousness among adults, unhealthy additives & ingredients in processed cheese, and perishable nature of the products are expected to hamper the market growth during the cheese market forecast period. Moreover, developing market for low-fat cheese and various innovations to improve the taste & quality of the products provide new opportunities in the market.

Table:3.1 Key Cheese Market Segments

By Type	By Production	By Source	By Distribution Chain	By Geography				By Market Player
Natural	Mozzarella	COW MILK	Hypermarkets	North America	Europe	Asia-Pacific	LAME A	ARLA FOODS
Processed	Cheddar	SHEEP MILK	Supermarkets	U.S.	UK	China	Brazil	BEL GROUP
	Feta	GOAT MILK	Food Specialty Stores	Canada	Germany	India	Argentina	FONTERRA FOOD
	Parmesan	BUFFALO MILK	Convenience Stores	Mexico	France	Japan	South Africa	KRAFT HEINZ
	Roquefort		Others		Italy	South Korea	KSA	LACTALIS GROUP
	Others				Spain	Austral	Rest of	SAVENCIA SA

By Type	By Production	By Source	By Distribution Chain	By Geography				By Market Player
						ia	LAMEA	
					Rest of the Europe	Rest of Asia-Pacific		BRITANNIA INDUSTRIES LIMITED
								ASSOCIATED MILK PRODUCERS INC.
								SAPUTO INC.
								GUJARAT COOPERATIVE MILK MARKETING FEDERATION LTD.

The cheese market is segmented based on source, type, product, distribution channel, and region. By source, it is divided into cheese obtained from cow milk (whole milk and skimmed milk), sheep milk, goat milk, and buffalo milk. The type of segment is bifurcated into natural cheese (hard cheese and soft cheese) and processed cheese (spreadable cheese and block cheese). By product, it is classified into mozzarella, cheddar, feta, parmesan, Roquefort, and others. By distribution channel, it is divided into hypermarkets, supermarkets, food specialty stores, convenience stores, and others. By region, it is analyzed across North America, Asia-Pacific, Europe, and Latin America, Middle East and Africa (LAMEA).

By source, the cow milk segment accounted for the highest revenue, in 2020. This is attributed to the presence of protein and fat in the milk which gives flavour and texture to the cheese. Furthermore, before the cheese making process starts, the cow's milk is pasteurized by heating the milk to a precise temperature and then rapidly cooling it. Heating milk kills the harmful bacteria present in the milk.

By product, the Cheddar segment generated the highest revenue, in 2020, owing to its harder texture, creamier and sharp taste, and longer shelf life. In addition, the price of cheddar cheese is low as compared to that of other cheese like mozzarella, which make cheddar cheese affordable. Also, cheddar cheese is available in single slices wrapped in plastic, cheese spray, cheese spread, squeeze tube, and various other packaging options, which have opened a lot of opportunities for the market growth.

By distribution channel, the business-to-business segment generated the highest revenue, in 2020, owing to the surge in demand for QSR and online food delivery, which is propelling cheese market demand.

By region, Europe contributed the highest the highest share in cheese market analysis 2020, registering a CAGR of around 2.1%, attributable to high demand in France, Finland, Denmark, Germany, and other countries. Asia-Pacific is the fastest growing region followed by LAMEA, owing to increase in cheese consumption in various emerging economies.

In 2021, the European Union consumed about 9.1 million metric tons of cheese, an amount that far exceeded consumption numbers in other parts of the world. In 2019, China, which has a population three times as large as that of the EU, only consumed an estimated 409 thousand metric tons of cheese.

3.2 Key cheese market players outside Nepal

The key players operating in the cheese market are Arla Foods, Bel Group, Fonterra Food, Kraft Heinz, Lactalis Group, SAVENCIA SA, Britannia Industries Limited, Associated Milk Producers Inc., Saputo Inc., and Gujarat Cooperative Milk Marketing Federation Ltd.

The other players in the value chain include Almarai Co. Ltd., Sargento Foods Incorporated, FrieslandCampina, Dzintars, Go Cheese, Parag Milk Foods, Gebrder Woerle Ges.m.b., Mother Dairy, Old Fashioned Cheese, Vindija dd, and Bletsoe Cheese, Inc

3.3 Key cheese and chhurpi market player in Nepal

To stay afloat in the market, however, manufacturers and exporters need to make sure that they keep re-engineering and diversifying the product: High up in the Himalayas, where yak have roamed the mountainsides for centuries, generation after generation of Nepalese have leisurely chewed on a cheese known as chhurpi. Made in part from yak milk, chhurpi is hard at first but softens into a consistency like chewing gum to slowly dissolve in a tangy taste.

The key market player in Nepal for cheese is Dairy Development Corporation (DDC) and other 17 privately owned Kanchan cheese producers.

A few industrious Nepalese entrepreneurs came up with a way to expand chhurpi's marketability beyond Nepal's traditional food sector and tap into a global market worth billions of dollars: the pet food industry.

Today, churpi has quickly become an international market hit, refined, adapted, and sold as a dog chew. Mohindra Singh Judge is one of the inventive entrepreneurs that saw chhurpi's money-making potential. He started selling churpi in 2011, until one day he saw an opportunity to scale up operations and enter the pet food industry. "Churpi is a 100% natural product, handmade through traditional methods and natural ingredients, like milk, lime juice, and salt. Although it's known locally as a traditional snack, overseas it has become very popular as dog chew," says Judge. "It's considered one of the best chews by veterinarians in its product category."

Godawari International Pvt Ltd, is one of the largest processors of high-quality churpi in the country, with exports to India, Japan, Taiwan, Canada, and the United States. Godawari procures and processes its products through direct trade relationships with over 2,000 farmers in the eastern Himalayas.

To complete the process, the churpi is delivered to Godawari's processing plant where it's sorted for quality, then cut, processed, treated, inspected, and finally sent to local distributors and exporters.

It was made possible with support from the Nepal's Ministry of Agricultural Development-World Bank Group Project for Agriculture Commercialization and Trade, and technical assistance provided by infoDev with funding from the governments of Finland, Norway, and Sweden. [Nepal: Seizing Opportunity by the Teeth - World Bank Group, https://www.worldbank.org/feature/2018/11/01/ne....](https://www.worldbank.org/feature/2018/11/01/ne...)

Until now, exact data on the export of cheese is not available in Nepal. In recent years, The Himalayan Dog Chew Company has started exporting dry cheese (called Chhurpi in Nepali) to the United States, Britain, Canada, and Japan which is commonly referred to as "dog chew" (Onlinekhabar, 2019).

Province and exporter of chhurpi from Nepal (September 23, 2017 04:13 PM NPT By: Republica News paper) ILAM, Sept 23: Approximately 60 quintals of Chhurpi (a traditional cheese) worth about Rs 8 million is exported every month to the United States of America from Ranke Bazaar bordering Ilam and Panchthar districts, local traders said.

The cheese is collected from various places in Ilam including Chamaita, Ektappa, Phuitappa, Sankhejung, Puwamajhuwa, Phakphok, Aamchowk, and Chilingden, Panchami and Phaktep in Panchthar before exporting to the US, said Sanjaya Limbu involved in the business. "The collected cheese is transported to Kathmandu before reaching the US," he added. The price of the cheese is set at Rs 750 to Rs 900 per kilogram in the local market, while it is sold for Rs 1,300 to Rs 1,500 per kilogram after its grading and packaging.(RSS)

Sanjib ChaudharyDecember 13, 2019 (online khabar)- According to the Nepal government's Trade and Export Promotion Centre, in the fiscal year 2017/18, the country exported more than 800 million Nepalese Rupees (US \$7 million) worth of CHHURPI. According to local businessmen, about 60-70 percent of the CHHURPI exported as dog chew to the United States and Europe is produced in the Ilam district itself.

International Himalayan Dairy Industries Pvt Ltd (IHDI), specializes in manufacturing delicious, healthy, and high-quality organic dog treats for pets around the globe. Its office is located at Baluwatar-3, Kathmandu- 44600,Nepal and 121 King Street, Melbourne, Australia. Gayetri Dairy, Hetaunda and expanding his business site to Kamane of Makwanpur district for drying of chhurpi. Out of total Chhurpi, 15% directly export to USA and other sold to exporter in Kathmandu are Global Dog Chew, Sliver Ling and NLA.

Himalayan Dog Chew (This company directly retail in USA), others wholesale to companies in USA while others wholesale to companies in USA. It is also being practiced to add flavour of different kinds e.g: strawberry, Aalas and others. Sometimes significant quantity of refused from USA.

3.4 Producer farmers and/or their associations, industries, major exporters of chhurpi from Nepal

It is not confirmed how many chhurpi exporters are in Nepal. During the study period, it was found that there are 26 chhurpi exporting agencies in Nepal. They normal export in the name of dog chew rather than Chhurpi. It is not confirmed but perceive that all export as hard cheese is Chhurpi. There is the name dog chew in Trade Promotion Center but not mentioned the name in foreign trade statistics.

Table 3.2 Exporter of chhurpi from Nepal:

SN	Store	Address	Phone	Export
1	Godawari International Pvt. Ltd	Godawari-3,		India, Japan, Taiwan, Canada, and the United States.
2	Dog Chew Store in Kathmandu	Nirmal Lama Marg, Kathmandu 44600	985-1018264	
3	Dog Chew Store in Kathmandu	Mhepi Janamarga 191, Kathmandu 44600	985-1018264	
4	Himalayan dog chew manufacture and wholesale	Store in Nagarjun Municipality	984-1701458	Canada
5	Himalayan dog chew manufacture and wholesale	Mandev Marg, Bhaktapur 44600	985-1212507	
6	Himalayan Natural Food Products and Export Pvt. Ltd Manufacturer, wholesale and Exporter	Nayabasti Jorpati Kathmandu	00977-1-4700768, 9779851189227	

SN	Store	Address	Phone	Export
7	KK Export & Import, Best Dog Chew from Nepal, Dogchew in Nepal	House No. 137/26, Barahi Cross 1, Jawagal Tole, Lalitpur, Nepal	+977 9803049235	
8	National Exports Pvt. Ltd.	Mahdevtole, Ward 8, Tarkeshwor Municipality, GPO Box: 3835, Kathmandu, 44610	+977 1 4025717	United States of America, United Kingdom, Canada, Australia, Italy, Ukraine, Russia, Germany, Poland & Many More
9	Mountain Pet Pvt. Ltd			
10	Himalayan Natural Food Product & Export Pvt.Ltd		985-1189227	
11	Native Nepal Agro Suppliers	Nagarjun – 01 (Buddha Chowk), Kathmandu , Nepal	977-9841701458	
12	Nepal Export company Limited	Paknajor Marg, Thamel, Kathmandu, Kathmandu 44600, Nepal	977-9801396660	www.nepalexportcompany.com
13	International Himalayan Dairy Industries Pvt Ltd	Panchakanya Heights, Baluwatar - 3, Kathmandu 44600	980-8444492	
14	Perfect Exports Pvt Ltd.	Samakushi -26, Kathmandu 44600	984-1586412	
15	Himalayan Natural Food Product and Export Pvt.Ltd	13, NayaBasti, 44600	01-4700768	
16	Yak Chew Supply Co	Nagarjun Municipality-02, Thulo Bharyang, Kathmandu	982-8214177	
17	Everest Dog Chew Pvt. Ltd	sindhu Road, Nagarjun 44600	980-8666456	
18	AR Unique Traders Pvt Ltd	M9X3+R6C, Kathmandu 44600	985-1099622	
19	Nepal Dog Chews	M7XR+JQ6, Kathmandu 44600	984-1372090	
20	Nepalico foodstuffs pvt.ltd	P8MV+XW9, Kathmandu 44600	980-1039714	
21	Agroculture, Nepal	Kalopul-7, Kathmandu	977 -01-4487957	
22	HOBB CREATION INDUSTRIES PVT. LTD Biswash Shrestha	Himtaj marj, Pepsi cola, Kathmandu-32, Nepal, Kathmandu, Nepal	9841709592, 9841350543 http://www.hobbcreation.com.np	
24	Moon Light, Damak , Jhapa	Chandra Prakash Dhungel		

SN	Store	Address	Phone	Export
25	International Himalayan Dairy Industries Pvt Ltd (IHDI)	Baluwatar-3, Kathmandu-44600,Nepal 121 King Street, Melbourne	.+977-9808444492, info@thedogchew.com ,	
26	Gayetri Dairy, Hetaunda in the name of Global Dog Chew, Sliver Ling, NLA	Niranjan Koirala: Hetaunda, Makwanpur	9845103614,	

Source: Field Survey 2022

3.5 Quality of Yak Cheese and Chhurpi

Since there is no specified quality standard for export of yak cheese and chhurpi, no standard quality examination has been done. General practice is that the Cheese/Chhurpi producers come to DFTQC and requested to check their sample for specific physico-chemical quality. Based on their request sample tested and provide the test report to the applicant entrepreneur. However, effort was made to collect the data on physico-chemical quality.

3.5.1 Physico-chemical quality of cheese

Effort was made to collect the physico-chemical quality of yak and other cheese but could not get it separately. However, data on cheese is found as published by DFTQC in 2017 which is mentioned in Table: 3.3 below.

Table: 3.3 Physico-chemical quality of cheese

SN	Parameter	Value
1	Edible protein	100
2	Moisture (g)	40.3
3	Protein (g)	24.1
4	Fat (g)	25.1
5	CHO (g)	6.3
6	Mineral (g)	4.2
7	Fibre (g)	
8	Energy (kcal)	348
9	Calcium (mg)	791
10	Phosphorous (mg)	520
11	Iron (mg)	2.1
12	Carotin (mg)	0
13	Vitamin C (mg)	0
14	Riboflavin (mg)	0
15	Thiamine (mg)	0
16	Niacin (mg)	0

Source: Department of Food Technology and Quality Control (Department of Food Technology and Quality Control (2017)

3.5.2 Physico-chemical quality of chhurpi

Since many chhurpi exporters come to DFTQC and request to test their sample any samples was tested, and three years compiled data was collected which is mentioned in Table: 3.4 below.

Table: 3.4 Physico-chemical quality of chhurpi

SN	Moisture	Fat	TA	Protein	CF	CHO	EV (kcal/100g)
Average	12.62	1.43	5.66	68.82	0	10.17	326.63
Maximum	30.1	5	8.1	76.3	0	28.7	361.5
Minimum	6.2	0.5	3	53.8	0	0.8	272.6

Source: National Food and Feed Reference Laboratory, 2074/75 to 2076/77

As per DFTQC officials, some exporter also requests to check the bacterial quality too. Based on their request the bacterial quality of chhurpi as tested is explained in table: 3.5 below:

Table: 3.5 Bacterial quality of chhurpi

	TBC (CFU/g)	Y/M (CFU/g)	Mold (CFU/g)	Coliform count (CFU/g)	E,Colo (CFU/g)	Salmonella spp (CFU/25g)	Staphylococcus aureus (CFU/.2g)
Positive	8	5	12	1	6	2	3
Negative	163	166	159	170	165	169	168
% positive	4.91	3.01	7.55	0.59	3.64	1.18	1.79

Source: National Food and Feed Reference Laboratory, 2074/75 to 2076/77 (N= 171)

3.6 Import and export of Yak Cheese and Chhurpi in last 10 years

3.6.1 Export and Import of Cheese in Nepal

Nepal imports in significant quantity of cheese compared to export. The trend of import is increasing year by year. In FY 2078/2079, total import of cheese was 142013 kg while it was 508847 kg in FY 2077/2078, and it was 129055 in FY 2068/2069. On the other hand, in export is also increasing but in very low pace, there was no export in FY 2078/2079 while the export in FY 2077/2078 was 38008 kg which was 11071 in FY 2068/2069.

Table: 3.6 Export and Import of Cheese in Nepal

	Export		Import	
Fiscal Year	Qty ((Kg)	Amount (Rs)	Qty ((Kg)	Amount (Rs)
2078/2079	0	0	142013	91433931.9
2077/2078	38008	66220479	508847	314836319
2076/2077	8527	15555314	413882	262799124
2075/2076	46412	62978154	302021	168643174
2074/2075	96482	131506044	281825	181336742
2073/2074	107254	138615016	207616	113072653
2072/2073	43758	49232312	153024	84914777
2071/2072	44228	35770090	173662	99188660
2070/2071	4904	3333220	193939	94696108
2069/2070	5949	5649265	170712	69923590
2068/2069	11071	1818680	129055	40069785

Source: Nepal Foreign Trade Statistics

3.6.2 Export and Import of Chhurpi in Nepal

There is no data on chhurpi/dog chew in Nepal Foreign Trade Statistics. Since the export of chhurpi is very new, there is no data of last ten years. It was not possible to get data on the quantity of chhurpi export and only value is export is available from Trade Promotion Center. Total value of export was NRs. 800000 in FY 2017/2018, which was NRs. 1965046 in 2020/2021 and NRs. 1425052 in FY 2021/2022. The export of chhurpi/dog chew is mentioned in table: 3.7

Table: 3.7 Export of Chhurpi (Value in NRs. '000)

2017/2018	2020/2021	2021/2022
800000	1965046	1425052

Source: Trade promotion Centre, Nepal

3.6.3 Projected Export Import of Cheese in Nepal next 10 years.

The projection has been done based on the past import export trend and considering possible improvement in future. It is estimated that a total of 39718 kg of cheese will be exported and imported 496126 kg in 2022/23. While estimated export is calculated at 61621 kg and import is calculated at 313059 kg FY 2032/33. The estimation has been done considering the trend of population growth, food habit, income of the people and current trend in milk production and government incentives toward production-based grant to the farmers.

Table: 3.8 Projected Export Import of Cheese in Nepal

Fiscal Year	Export		Import	
	Qty ((Kg)	Amount (Rs)	Qty ((Kg)	Amount (Rs)
2022/23	39718	69531503	496126	299094503
2023/24	41704	73008079	473800	284139778
2024/25	43456	76658482	452479	269932789
2025/26	45324	80491407	432118	256436149
2026/27	47319	84515977	412672	243614342
2027/28	49448	88741776	394102	231433625
2028/29	51673	93178865	376367	219861943
2029/30	53999	97837808	359431	208868846
2030/31	56428	102729698	343257	198425404
2031/32	58968	107866183	327810	188504134
2032/33	61621	113259492	313059	179078927

Source: Consultant's estimation

3.6.3 Projected Export of Chhurpi from Nepal in next 10 years.

It is not assumed that Nepal will import chhurpi and not estimated on it. Moreover, export is expected to be increased year by year. The pace of increasing the export is estimated bit lower in coming 5/6 considering that COVID-19 is almost over, and the milk shall be sold for processing fluid milk. Thereafter, the chhurpi export will again accelerate. Total export in coming fiscal year 2022/23 is calculated at 1567 ton with total value NRs. 176.73 million which is expected to be increased to 3245 Mt with value NRs. 301.83 million. The estimation has been done considering the trend of export since last 4 years, current trend in milk production and government incentives toward production-

based grant and extending arms of the chhurpi processors to interior parts of the country and possibility of market expansion in human chew too.

Table: 3.9 Projected export of chhurpi from Nepal

Fiscal year	Qty (ton)	Export value (NRs) '000
2022/23	1567	1527641
2023/24	1629	1604023
2024/25	1711	1700264
2025/26	1814	1802280
2026/27	1941	1892394
2027/28	2086	1987013
2028/29	2253	2106234
2029/30	2445	2211546
2030/31	2665	2322123
2031/32	2918	2461451
2032/33	3239	2609138

Source: Consultant's estimation

3.6.4 Trend and price of Yak Cheese and Chhurpi over last 10 years in national and international

From the secondar data, the price of cheese and chhurpi is in increasing trend with annual increment from 3 to 5 percent in the domestic market. While trend of cheddar cheese price increment in international market is bit different as the fluctuation found to decrease or increase by 10 to 17 percent.

Table: 3.10 Trend and price of Yak Cheese and Chhurpi over last 10 years in national and international

Year	Domestic Market price				Cheddar cheese Global market (USD/Mt)
	Yak Cheese (Rs/kg)	Kanchan Cheese (Rs/kg)	Processed Cheese (Rs/kg)	Chhurpi (Rs/kg)	
2011/2012	670	500	400		3,877
2012/2013	1000	600	400		4,563
2013/2014	1000	700	250		4,542
2014/2015	1000	700	400		3,076
2015/2016	1440	900	450		2,807
2016/2017	1600	1000	500		3,664
2017/2018	1600	1000	500		3,736
2018/2019	1800	1000	450	750	3,435
2019/2020	1800	1000	450	850	3,878
2020/2021	1800	1000	450	950	4,280

Source: Global Market: FAO Dairy Market Review Report 2020, and Global Dairy Trade Annual Report 2020 and March 2021

Source: Domestic market price: DDC report in consecutive year and Study on Situation Analysis of Nepalese Marketing Intelligence in Dairy Sector-NDDB 2021

3.6.4 Projected market price of cheese and chhurpi in domestic and international market for next 10 years.

Projection of cheese and chhurpi has been done by considering the trend of last 10 years. Nepal market is bit stable. Reduction in market price is not observed in Nepali market while there is fluctuation in cheese price in international price ranging from 10 to 17 percent.

Table: 3.11 Projection of cheese and chhurpi price for last 10 years.

Year	Yak Cheese (Rs/kg)	Kanchan Cheese (Rs/kg)	Processed Cheese (Rs/kg)	Chhurpi (Rs/kg)	Cheddar Cheese (USD/Mt)
2021/2022	1800	1000	450	1100	4,794
2022/2023	1908	1060	477	1166	5,513
2023/2024	1984	1102	496	1213	5,954
2024/2025	2084	1158	521	1273	6,251
2025/2026	2209	1227	552	1350	5,939
2026/2027	2319	1288	580	1417	6,770
2027/2028	2412	1340	603	1474	7,312
2028/2029	2556	1420	639	1562	7,970
2029/2030	2684	1491	671	1640	9,086
2030/2031	2845	1581	711	1739	8,450
2031/2032	2988	1660	747	1826	9,210

Source: Consultant's estimation

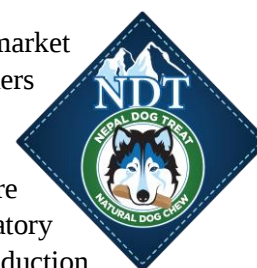
Since the chhurpi production is in increasing trend yak cheese has good goodwill in the international market, it is very much required to regulate this business and facilitate for export.

Having very good climate for yak/chaury farming and plenty of unused land in high hill and mountain area, there is tremendous opportunity to farm yak/chaury. Milk produced shall be used for making cheese and chhurpi which are potential export commodity. It is urgent need to attract new farmers showing the benefit and good source of income. The output-based incentives/grant policy shall be good tool to attract them. The slogan Yak circuit could add value for integration of yak/chaury farming, cheese and chhurpi production and tourism. Reforming the current on slaughtering yak/chaury could add additional value for tourism development as European and American tourist much like yak soup.



As mentioned by the chhurpi exporter, based on the market survey in the international market, different chhurpi makers and traders are exporting the product in the name of dog chew, but it is not understood what quality is being exported by these exporters. The day may come when entire export business collapsed if there will be no proper regulatory mechanism. For the promotion of yak cheese/chhurpi production and marketing specific standard of these products must be defined. Based on the defined quality

standard of the product, the producers shall bring in an umbrella and export by single trademark and collective mark. The process for taking trademark, logo and collective marking could be good initiative to market the product abroad which is explained in chapter 5 of this report.



3.5.5 Yak Cheese and Chhurpi produced with grading of products.

Except DDC, other private Yak Cheese producers do not practice on grading of products. and Chhurpi producers who produce for export of the products normally do practice on the grading. But they don't have single method or criteria for grading. According to DFTQC, the producers come to certify the products and different producers demand different specification.

CHAPTER-4

LEGAL FRAMEWORK OF YAK CHEESE PRODUCTION AND MARKETING

Organizational and policy framework for the regulation of legal standard in Nepal, organized dairy development activities began in 1952 with the establishment of the Yak cheese factory in the Rasuwa districts under FAO assistance (FAO, 2010). The dairy sector gets acceleration on its growth with the establishment of the Dairy Development under the Department of Agriculture (DOA) in 1954 (GIDA) Nepal P.Ltd, 2012. The First Five Year Plan (1956-61) stressed the need to develop a modern dairy industry (NPC, 1956).

4.1 Policy Framework

4.1.1 Animal health and livestock services act 1998 and Regulations 1999

The animal health and livestock service act 1998 and regulations 1999 have been formed and enforced for the healthy production, sale, and distribution of animal and their products. The act also regulates the import and export of livestock, their products, and livestock production material important for food and health purpose of the people. The act made the provision for animal quarantine posts to regulate the import of animals, animal products, and animal production materials

4.1.2 The Consumer Protection Act, 2075 (2018)

The Consumer Protection Act, 2075 (2018) Date of Authentication 2075/6/2 (18 September 2018) Act Number 10 of the year 2075 (2018) An Act Made to Provide for Amendment and Consolidation of Laws Relating to Consumer Protection. The Act is expedient to make amendment to and consolidation of the legal provisions relating to consumer protection in order to protect and promote constitutional rights of the consumers to obtain quality goods and services, to provide judicial remedy for the enforcement of the rights obtained by the consumers and provide compensation for harm and injury likely to be caused to the consumers.

4.1.3 Food Act, 2032 B.S

Food safety regulation in Nepal began in 1966 by enforcing the food act and Food rules 1970 by the government. It is the primary legislation governing the regulation of food safety in Nepal (Bajgain, 2012). The food acts prohibited to produce, sell, distribute, export, or import any adulterated food or sub-standard food or hold such food for any of such purposes. This also prohibited sell or distribute any food by lying or misleading that food to be another food or any food of lower standard to be of a higher standard. This act has a provision to form a standard fixation committee to update standards from time to time. Also, the government has the right to specify the quality standard of the food (Government of Nepal, 2023).

4.1.4 Patent Design and Trademark Act 2022 (1965)

Patent Design and Trademark Act 2022 (1965) Patent Design and Trademark Act first Amendment Act 2044, Justice Administration Act 2048, Import, Export, Intellectual Property related few Nepal Act Amendment Act 2063, Federalisms Strengthening and few Nepal Act Amendment Act 2066, Few Nepal Act Amendment Act 2072, Act no 15 2022. The Act was promulgated for the service and economic right of the general people on Patent Design, Trademark.

4.1.5 Dairy Development Policy, 2021

Dairy Development Policy has tried to review and update of quality control of milk and dairy products; preparation and implementation of appropriate packing standard of milk and dairy products; regular quality monitoring of the marketed milk and dairy product; consumers' awareness about storage methods, consumption duration, consumption methods of these products; implementation of code of practice for milk collection and processing at the milk chilling centres and dairy processing factories; and strengthening of laboratories at different levels for supporting the production and marketing of quality milk and dairy product.

4.1.6 Collective mark Guideline 2067:

Though there is not clear about collective mark in Patent Design and Trademark Act 2022 (1965), collective mark is also a part of trademark and Nepal is a member of Paris Convention for Industrial Property Protection where collective mark is included. Since it is the responsibility to follow the resolution of Paris Convention and some Industrialists are demanding for registering collective mark to explore Nepalese specialty, identity in domestic and international market, it is required to establish institutional framework on it. Visualizing this fact, Collective mark Guideline 2067 has been enacted.

4.2 Institutional Framework Dealing with Quality

4.2.1 National Dairy Development Board (NDDB)

National Dairy Development Board was established in 1992. This organization assists the Nepal government to formulate the different policies and plans related to the Dairy sector. It also provides technical assistance for setting-up, improving, promoting, and safeguarding dairy industries (GIDA Nepal P.Ltd, 2012).

4.2.2 Dairy Development Corporation (DDC)

DDC was established in 1969 under the Corporation Act of 1964, known by its acronym DDC. DDC is a completely state-owned corporation initiated for the economic development of the poor farming communities. It provides a guaranteed market for milk to the rural farmers with a fair price; supply pasteurized milk and milk products to urban consumers; develop organized milk collection system to meet the increasing demand for pasteurized milk and milk products and develop an organized marketing system for milk and milk products in urban areas.

4.2.3 Department of Food Technology and Quality Control

Department of Food Technology and Quality Control (DFTQC) was established in 1961. This organization has been mandated with quality control of dairy products, research, and development of food processing and nutrition support programs. DFTQC is the sole governmental agency for implementing the Food Act for the enhancement of quality and safety of food and feed products in the country. Recently Nepal government-endorsed the National food safety policy 2076 (2019) to build a consolidated food standard and safety.

4.2.4 Department of Livestock Services (DLS)

Department of Livestock Services also shares some responsibilities for the implementation of rules and regulation in animal production to ensure the safety of animal origin food. Enforcement of Animal Health and Livestock Services Act 1998, Animal Health and Livestock Services Regulation 1999, Animal Slaughterhouse and Meat Inspection Act 1999, and Animal Slaughterhouse and Meat Inspection Regulation 2001 are under the jurisdiction of this department. Moreover, animal disease

surveillance, management of animal quarantine check posts, regulation of the drug, and hormone used in food animals are some of the major responsibilities of the DLS.

4.2.5 Other Institutions

National Council for Standards (NCS) is the government body responsible to approve and endorse Nepalese standards. Nepal Bureau of Standards and Metrology (NBSM) acts as the secretariat for the NCS which prepares the country standards (Nepal standard) of food products and methods of food processing. Department of Industry (DoI), Department of Custom (DoC), Trade Promotion Center (TPC) etc.

4.3 International membership

In the present world of interdependence and economic globalization international relationships, bilateral and multilateral agreements, and international trade also affect the policy, rules, and regulations of a country. The country must comply with the rules and regulations of such international organizations and agreements. Nepal is a member of the following international organizations which affects the food safety-related policy, rules, and regulations.

- Codex alimentarius commission
- World trade organization (WTO)
- Food and agriculture organization (FAO) of the United Nations (UN)
- South Asian Association for regional cooperation (SAARC)
- World organization for animal health (OIE)
- Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC).

4.3.1 Review codex, OIE code, SPS agreements, national legal documents related with production and trade of cheese and Chhurpi.

The Codex Alimentarius Commission (CAC), the joint body of the World Health Organization (WHO) and Food and Agriculture Organization (FAO) of the United Nations (UN), is responsible for implementing the Joint FAO/WHO Food Standards Programme and is the intergovernmental body mandated to develop codes of food and related texts that are part of the Codex Alimentarius (Food Code). As on September 2017, the CAC had 188 Codex Members – 187 Member States and one Member Organization, the European Union (EU).

The mission of Codex Alimentarius is well known to food law practitioners: protecting health of consumers and facilitating international food trade establishes product standards which, although not being compulsory for their member States, are in many cases introduced into national laws throughout the world, or serve at least as references in international trade. Indeed, the Technical Barriers to Trade (TBT) agreement of the World Trade Organization (WTO) encourages Member States to harmonize their regulations in conformity with international standards such as the Codex, which is explicitly mentioned. Conformity to such standards is a presumption of justification of national rules. Member States of the WTO may also set up product regulations that deviate from Codex Standards that may entail barriers to trade, but those decisions/barriers/regulations must be scientifically justified/based on appropriate scientific risk assessment.

It must also be mentioned that, although the EU is not committed to introduce Codex standards as such in its own regulations, the evolution of Codex rules have been taken into account for the modification of some EU directives, such as Fruit Juices¹. Such standards are also sometimes referred to by the European Court of Justice to assess whether a national rule, in a non-harmonized field, can justify intra-community barriers to trade².

The way Codex standards are established is therefore essential to maintain their efficiency and credibility.

The Codex Alimentarius Commission was established in May 1963 during the World Health Assembly. It has two parent organisations, FAO and WHO, and represents the executive organ of the joint FAO and WHO related to Food Standards Programs.

While FAO and WHO have a role in setting policies which can be enforced directly by their member countries, the Codex is an autonomous legal entity which acts independently from its parents institutions in its decision making.

By contrast with FAO and WHO which are mandated to set policies, strategies and guidelines in the areas of food and agriculture and public health, respectively, the Codex Commission's mandate is confined to set internationally agreed food standards (be they specific to some products or horizontal, such as contaminants or labelling) that serve to protect consumer health and ensure fair practices in food trade.

4.3.2 Review codex, OIE code, SPS agreements, national legal documents related with production and trade of cheese and Chhurpi.

The OIE collects and analyses the latest scientific information on animal disease control. This information is then made available to the Member Countries to help them to improve the methods used to control and eradicate these diseases. Guidelines are prepared by the network of 246 OIE Collaborating Centres and Reference Laboratories across the world.

The OIE provides technical support to Member Countries requesting assistance with animal disease control and eradication operations, including diseases transmissible to humans. The OIE notably offers expertise to the poorest countries to help them control animal diseases that cause livestock losses, present a risk to public health and threaten other Member Countries.

The OIE develops normative documents relating to rules that Member Countries can use to protect themselves from the introduction of diseases and pathogens, without setting up unjustified sanitary barriers. The Main normative works produced by the OIE are: The terrestrial animal health code, the manual of diagnostic tests and vaccines for terrestrial animals, the aquatic animal health code and the manual of diagnostic tests and vaccines for aquatic animals.

OIE standards are recognized by the World Trade Organization as reference international sanitary rules. They are prepared by elected specialist commissions and by working groups bringing together internationally renowned scientists, most of whom are experts within the network of about 246 collaborating centers and Reference Laboratories that also contribute towards the scientific objectives of the OIE.

The Veterinary Services and laboratories of developing and transition countries are in urgent need of support to provide them with the necessary infrastructure, resources and capacities that will enable their countries to benefit more fully from the WTO Sanitary and Phytosanitary Agreement (SPS Agreement) while at the same time providing greater protection for animal health and public health and reducing the threat for other countries which are free of diseases. The OIE considers the Veterinary Services as a Global Public Good and their bringing into line with international standards (structure, organization, resources, capacities, role of paraprofessionals) as a public investment priority.

The OIE Member Countries have decided to provide a better guarantee of the safety of food of animal origin by creating greater synergy between the activities of the OIE and those of the Codex Alimentarius Commission. The OIE's standard-setting activities in this field focus on eliminating

potential hazards existing prior to the slaughter of animals or the primary processing of their products (meat, milk, eggs, etc.) that could be a source of risk for consumers.

Since it was created, the OIE has played a key role in its capacity as the sole international reference organization for animal health, enjoying established international recognition and benefiting from direct collaboration with the Veterinary Services of all its Member Countries. As a mark of the close relationship between animal health and animal welfare, the OIE has become, at the request of its Member Countries, the leading international organization for animal welfare. <https://www.oie.int> > ... > [Standards > Codes and Manuals](#).

4.3.3 SPS agreements, national legal documents related with production and trade of cheese and Chhurpi.

The Agreement on the Application of Sanitary and Phytosanitary Measures (the "SPS Agreement") entered into force with the establishment of the World Trade Organization on 1 January 1995. It concerns the application of food safety and animal and plant health regulations. This introduction discusses the text of the SPS Agreement as it appears in the Final Act of the Uruguay Round of Multilateral Trade Negotiations, signed in Marrakesh on 15 April 1994. This agreement and others contained in the Final Act, along with the General Agreement on Tariffs and Trade as amended (GATT 1994), are part of the treaty which established the World Trade Organization (WTO). The WTO superseded the GATT as the umbrella organization for international trade.

The WTO Secretariat has prepared this text to assist public understanding of the SPS Agreement. It is not intended to provide legal interpretation of the agreement.

The World Organization for Animal Health (OIE), ensure transparency in the global animal disease situation. Each Member Country undertakes to report the animal diseases that it detects on its territory. The OIE then disseminates the information to other countries, which can take the necessary preventive action. This information also includes diseases transmissible to humans and the intentional introduction of pathogens. Information is sent out immediately or periodically depending on the seriousness of the disease. This objective applies to disease occurrences both naturally occurring and deliberately caused.

Food safety systems, along with food supply chains, are mandatory for countries to access global markets. Thus, international regulatory systems must be in place to ensure that food is safe for international market access and consumption. Therefore, the Sanitary and Phytosanitary (SPS) Agreement came into effect on January 1, 1995 with the establishment of the World Trade Organization (WTO). The SPS Agreement is a government-to-government interaction and applies only to those governmental measures that can affect international trade. This publication is not intended to be an official reference to the SPS Agreement so, please refer to the actual agreement for the exact language. **Barakat Mahmoud, Ph.D. (Food Safety)**, November 3, 2017.

4.3.4 National legal documents related with production and trade of cheese and Chhurpi.

I. While exporting the animal products Nepal has following rules and regulations:

a. Animal Health and Livestock Services Rules, 2056 (2000).

Rule 10

Quarantine Certificate; (1) The Quarantine officer shall, upon completion of the quarantine process for the animal, products of animal origin or livestock product materials to be imported, make available a Quarantine Certificate in the format referred to in Schedule-2 to the concerned person, as soon as possible.

2) While exporting the following animals, the product of animal origin or livestock product materials, the Veterinary Officer designated by the Quarantine Officer or by the Department shall have to make available the Health or Sanitary Certificate in the format of the following forms referred to in Schedule-3;

- a) For Dogs and Cats Form-1
- b) For domestic and wild animals Form-2
- c) For semen of animals Form-3
- d) For meat of animals Form-4
- e) For animal feeds and the products of animal origin which are to be used for industrial or medical purpose Form-5
- f) For equines Form-6
- g) For avian Form-7
- h) For eggs, day-old chicks, other newly hatched avian species and hatching eggs Form-8.

3) The certificate issued pursuant to sub-rule (2) shall be valid for ten days from the date of issue.

b. Animal Health and Livestock Services Regulation, 2056 (2000)

Rule 13. Recommendation Relating to Export and Import: (1) The person willing to obtain a letter of recommendation for the purpose of section 18 of the act shall have to submit an application on the format referred to in schedule -6 along with a fee of three hundred rupees.

(2) If the application referred to in Sub-rule (1) has been made, the Department shall, if it deems reasonable to make the recommendation upon an inquiry, issue the recommendation Letter in the format as referred to in schedule -7.

Animal Health and Livestock Services Act, 2055 (1999)

Animal Health and Livestock Services Regulation, 2056 (2000)- First amendment 2063 (2006)

Rule 14. The terms to be Abided by While Exporting: (1) While Exporting an Animal, the products of animal origin or Livestock Product materials, the Exporter shall abide by the following terms:

- a) A notice has to be served on the concerned Quarantine officer in advance specifying the type, Species and Breed origin and Number of the animals to be exported along with the point and possible date of Export.
- b) In case of animals having been visibly marked as appropriate symbol denoting the exportable Quality upon Examination by the Quarantine Officer and having obtained a health certificate from the Veterinary Officer.
- c) The transport vehicle to be used for exporting the animal, products of animal origin or livestock Products materials should be disinfected.
- d) The Products of Animal Origin or livestock products materials to be exported have to be examined by the Quarantine Officer, and
- e) The transport vehicle to be used for exporting the animals should be suitable from the technical point of view.

(2) The records of the animals, Products of animal origin or Livestock Products materials exported under this rule shall be kept by the concerned Quarantine Officer.

Ministry of Agriculture and Livestock Development issue the recommendation letter.

II. While importing livestock products:

a. Animal Health and Livestock Services Rules, 2056 (2000)

Rule 10 - Quarantine Certificate.

- 1) The Quarantine officer shall, upon completion of the quarantine process for the animal, products of animal origin or livestock product materials to be imported, make available a Quarantine Certificate in the format referred to in Schedule-2 to the concerned person, as soon as possible.
- 2) While exporting the following animals, the product of animal origin or livestock product materials, the Veterinary Officer designated by the Quarantine Officer or by the Department shall have to make available the Health or Sanitary Certificate in the format of the following forms referred to in Schedule-3;
 - a) For Dogs and Cats Form-1
 - b) For domestic and wild animals Form-2
 - c) For semen of animals Form-3
 - d) For meat of animals Form-4
 - e) For animal feeds and the products of animal origin which are to be used for industrial or medical purpose Form-5
 - f) For equines Form-6
 - g) For avian Form-7
 - h) For eggs, day-old chicks, other newly hatched avian species and hatching eggs Form-8.
- 3) The certificate issued pursuant to sub-rule (2) shall be valid for ten days from the date of issue.

b. Animal Health and Livestock Services Regulation, 2056 (2000)

Rule 15. The Terms to be Followed for Exporting (1) The Importer shall, while importing animal origin or Livestock Products materials, have to abide by the following terms:

- a) If, out of the animals Imported, any animals has died during the course of Journey after having been departed from the point of Departure, the particulars thereof shall have to be submitted to the Quarantine Officer:
- b) The Transport vehicle to be used for importing animal origin or Livestock Products materials have to be disinfected.
- c) The particulars as to identity marks, number or weight and types of the animal origin or Livestock Products materials shall have to be submit to the Quarantine Officer at the time of import
- d) The transport vehicle to be used for transport of the animals should be suitable from technical point of view

.Table: 4.1 Relevant documents, type, agency and law for Exporting the Cheese/Chhurpi

Name	Type	Agency	Description	Comments	Law	Validity
Certificate of Origin	Formality Requirement	Ministry of Finance	Section 21. Attachment of the documents with the declaration form: (1)	Comments	Customs Regulation, 2064	

Name	Type	Agency	Description	Comments	Law	Validity
			A person importing or exporting goods pursuant to Section 18 of the Act, while submitting declaration form to the customs officer, shall submit the following documents including Certificate of Origin.		(2007)	
Generalized System of Preferences (GSP)	Certificate Requirement	Ministry of Finance	21. Attachment of the documents with the declaration form:(1) As per section 18 of the Act, the person importing or exporting goods, while submitting declaration form to the customs officer, should submit following documents(a)..(b)...(c) For exportation(1) Invoice(2) Packing list(3) Certificate of Origin(4) Banking document regarding payment procedure, in case of export to third country(5) Documents which are required as per prevailing law regarding the recommendation, license, or certificate from any institution. However Certificate of Origin shall not be mandatory for the export in which G.S.P. certificate is required.	Comments	Customs Regulation, 2064 (2007)	

CHAPTER-5

TRADE PROMOTION AND COLLECTIVE TRADEMARK FOR YAK CHEESE AND CHHURPI

5.1 The trademark

A trademark refers to a name, word, phrase, logo, symbol, design, image, or a combination of these elements showing the difference from goods or services of others to the goods and services by any firm, company or individual. There is also a range of non-conventional trademarks comprising marks that do not fall into these standard categories, such as those based on colour, smell, or sound.

In Nepal, protection and enforcement of trademark are governed by the Patent, Design and Trademark Act, 1965 (PDTA). The Department of Industry (DOI) within the Ministry of Industry is the competent authority that registers and administers trademarks in Nepal. (Udayan Regmi Monday May 3, 2021, 9:46 am)

5.2 Need of Trademark Registration

A trademark registration provides assured advantages to the proprietor of the registered mark over the unregistered mark.

- It provides an exclusive right to the owner of the mark to use the mark and attach its identity with the goods produced or the rendered by it.
- It provides prima facie evidence of ownership and validity.
- It allows use of registered trademark or other suitable abbreviations to demonstrate ownership of trademark.
- It prevents the unfair competitors from using the registered mark.

FIRST TO FILE

The Registration of the mark will provide statutory protection over the mark as Nepal follows the "**First to File**" principle and the same is also enumerated under section 16 of the Nepalese Patents, Designs and Trademarks Act, 1965 which states that "A person can acquire under this act, title to the trademark of his business upon registration in the department".

5.3 Procedures for trademark registration

The process for registering a trademark in Nepal is explained below:

Step 1: Submission of an application for registration of a trademark to the DoI

An application in a prescribed format shall be submitted to the DoI for registration, along with all required documents.

Step 2: Preliminary examination of the application by the DoI

After an application is submitted, the same is then examined by the registrar with regard to the distinctiveness, possibility of deceptiveness and conflicting trademarks. The registrar may accept or refuse the application subject to the provisions of the act.

Step 3: Publication of trademark in the Industrial Property Bulletin (IP Bulletin)

After conducting a preliminary examination, if the DoI finds the trademark consistent with the law, such a trademark will be published in an IP Bulletin.

Trademarks are published in the IP Bulletin so as to invite the public for filing an opposition for registration of the trademark. An opposition against the published trademark shall be filed within 90 days of publication in the IP Bulletin.

Step 4: Registration of the trademark

If there is no opposition filed, the DoI will register the trademark and issue the trademark registration certificate.

Generally, it takes **about nine months to a year** to complete the process of trademark registration and issuance of trademark registration certificate where no petition for an opposition is filed.

a) Documents required

Following documents are required to file an application for the trademark registration in Nepal:

1. An application in the prescribed format
2. Certificate of registration of the proprietor of the trademark
3. Tax registration certificate of the proprietor
4. Label of trademark
5. Power of attorney (POA)

b) Ground of refusal of an application for the trademark

Section 18(1) of the PDTA has mentioned the following grounds upon which an application for a trademark can be rejected:

1. In case such trademark damages the reputation of any person or institution
2. In case such trademark contradicts public conduct/morale or national interest
3. In case such trademark damages goodwill of the trademark of any person
4. In case such trademark is found to have already been registered in the name of another person

c) Validity of the registered trademark

As per section 18D of the PDTA, the trademark shall remain **valid for seven years** from the date of registration.

Further, Section 23B (1) of PDTA mentioned that the trademark shall be renewed within the period of 35 days from the date of expiry. In addition to that, Section 23 B (2) provides the right to renew the trademark by making a payment of a penalty of Rs 1,000 within six months from the expiry of the said 35 days' period.

If the renew is not made within the given time, the registration will automatically get cancelled.

5.4 Collective Mark:

A collective Mark is another form of the trademark which is used by several cooperative associations, union or other collective group or other group or organization to identify source of goods or services. A collective mark termed as a mark which is utilized for goods and services with the same characteristics which are to be traded by one or more persons who is acting jointly or legal entity for differentiating the same kind of goods from other goods or services.

5.4.1 Process of getting collective trademark in Nepal

(a) Establishment, Formulation or Registered union, organization under the Nepal Government's Act/law/rule/guideline, cooperatives union or affiliated member of the union shall get collective trademark.

Any government, semi-government organizations registered under the Nepal Government's law or their member shall also get collective trademark.

5.4.2 Application registration

Application registration to Department of Industry as per Annex 1 of Collective mark Guideline 2067. The trademark taken by the organizations registered under (a) shall be used by their members as per the negotiation between trademark owner and its member.

The trademark taken by the organizations registered under (a) should register the application mentioning collective mark and submit additional documents viz: union, organization, institution or cooperative union's bylaw, details of members, rule of using mark or guideline should be submitted along with the application. While government or semi-government required to submit rule of using mark or guideline.

The rules or guideline should include following:

1. Product or service production process and quality standard/measurement
2. Code of Conduct to be follow by the materials or service producer.
3. Collective mark using contract between the mark owner and its members and duly signed Terms and Condition between the mark owner and member.
4. Mechanism to monitor the proper operation of contract between the mark owner and member and penalties provision if the contract is violated.
5. In case of union, institution, cooperative union, rule of using mark or guideline; decision of General Assembly to use collective mark is required while in case of semi government institution approval of authorized officials should be submitted.
6. The concern officer in Department of Industry, after the review of the documents submitted by the applicant and other trademark registration process, register the collective trade as per the Annex:2 of the Collective mark Guideline 2067.

5.4.3 Cancellation of the collective trademark

Concern institution, organization, Union or member of any cooperative or few other members use the collective trade without information to other members or violated rule of using mark or guideline; disseminating misinformation to the general public or against the public concerns about the origin of product or service, collective speciality, the Department shall cancel the collective mark.

The registration terms of the mark, renewal, penalties concerning abuse of the collective mark, fees/service charge shall be in accordance with Patent Design and Trademark Act 2022 (1965) Patent Design and Trademark Act first Amendment Act 2044.

In case of contradiction observe between Collective mark Guideline 2067 and Patent Design and Trademark Act 2022 (1965) Patent Design and Trademark Act first Amendment Act 2044, the Act shall be enforced.

If any problems arise, in approval of Ministry of Industry, the Department of Industry 's decision shall be applied.

The law relating to the Intellectual Property Rights in Nepal is embodied in The Patent, Design and Trademark Act, (2022) of 1965. Trademarks in Nepal fall under the jurisdiction of Department of Industries / Ministry of Industry, situated at the capital city of Kathmandu.

Some key points pertaining to trademarks in Nepal are enumerated below:

Relevant Office	Department of Industries
Law in Force	Patents, Designs and Trademarks Act, 1965
Nice Classification	Yes (9th Edition)
Paris Convention	Yes
Madrid Protocol	No
Multi- Class System	No
Document (s) Required to file a Trademark application	• Simply executed Power of Attorney • Simply executed trademark application • Certified copy of Home Country Registration Certificate or certificate issued in any other country with duly authenticated English translation thereof. Note: An application can be filed without aforesaid original documents and the same can be filed at a later date.
Prosecution Process	Filing Examination Publication of mark in the IP Bulletin Opposition Period (Three months from the date of publication) Registration Renewal
Registration Term	7 years from the date of registration
Renewal Term	7 years
Documents required for renewal	Original registration certificate, the Nepalese IP office does not issue any renewal certificate and the renewal due date is certified on the original registration certificate. The original registration certificate can be filed at a later date i.e. after filing request for renewal.
Cancellation Proceedings	A mark is vulnerable to a cancellation action by the Department of Industries <i>suo moto</i> or by a third party if it is not used within a period of one year from the date of registration.

Since Yak Cheese and chhurpi are identified as export commodity, quality assurance is crucial. More authentic and reliable agency assuring the quality could be the government owned institution. NDDB

shall be appropriate body to get trademark and distribute marks to yak cheese/chhurpi producers scattered at different parts of the country.

5.4.4 Steps to be undertake by NDDB to take the trademark of the yak cheese and Chhurpi

1. Organize workshop/meeting with the Chhurpi and Cheese producers in the country
2. Register yak cheese and chhurpi producers/ entrepreneurs in NDDB
3. Follow all the steps mentioned above for trademark registration
4. Design separate logo/trade mark for yak cheese and chhurpi
5. Submission of an application for registration of a trademark to the DoI
6. Get registration certificate of the trademark
7. Inform all the Chhurpi and Cheese producers on taking the collective mark
8. Prepare Nepali Chhurpi and Cheese certification Trademark Implementation directive
9. Prepare code of conduct and terms to be followed by the trademark user
10. Prepare procedural guideline on using the Chhurpi/Cheese LOGO
11. Prepare strategy for export of Nepali Chhurpi/Cheese
12. Prepare standard Nepali and export quality of Nepali Chhurpi and Cheese
13. Monitoring of the manufacturing practices undertaken by the trademark/logo users
14. Regularise the trademark users
15. Promotional activities in and outside of the country

CHAPTER- 6

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

According to National Historic Cheesemaking Center Museum, Green Country Welcome Center: Cheesemaking practice is closely related to the domestication of milk producing animals; primarily sheep, which began 8-10,000 years ago. Yak cheese and chhurpi are two important export oriented dairy products in Nepal. Yak cheese production in Nepal started in 1953 while the chhurpi may have longer history.

The yak cheese production is decreased dramatically since last two decades. While on the other hand the chhurpi / dog chew production is increased dramatically.

The major reason for decrease in yak cheese is lack of human resource, lower level of motivation among the new farmers on yak/chaury farming, higher cost of milk production, poor pasture land, poorly administered research, predation by the wild animal and increased motivation for foreign employment among the youths.

Similarly, the yak cheese production is very seasonal business and only operate in six months in a year. Retaining of the qualified human resource for yak cheese production is thus impossible. On the other hand, yak/chaury are mobile and move from one station to other in every two months and hence, it is costly to collect the milk. Similarly, maintaining cold chain is also difficult as there is poor electricity supply and solar system is also not cost effective.

Being a signing member country of the different international resolution, treaty and conventions viz: Codex alimentarius commission, World trade organization (WTO), Food and agriculture organization (FAO) of the United Nations (UN), South Asian Association for regional cooperation (SAARC), World organization for animal health (OIE), Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) etc it is very difficult to meet the standard set by these institutions.

Yak cheese is an established name for the yak milk-based product and Yak cheese is almost an established brand name of Nepal and Dairy Development Corporation (DDC) has taken organic certification for the Yak Cheese which is very good initiation. The benefit of this established name could be taken advantage of by the other yak rearing countries. Yak cheese has a well-established market, particularly in the tourist-dominated areas of Nepal, and is fetching relatively high prices. Yak cheese demand is not even fulfilled in Nepal, and there is demand from other countries too. Yak cheese has, therefore, a big potential.

While on the other hand, in last two years, the production and export of chhurpi/dog chew increased dramatically and total export value of the NRs. 1960 million. Chhurpi is exporting in the name of Dog chew in the international market, while in export statistics 'Dog Chew' is not listed. This indicated that, the export is done in different article. On the other hand, 'Dog Chew' is not observed in any space.

Structured SOP, CoC, GMP for yak cheese and chhurpi production is poorly administered and human resource for cheese making are not updating with the new technology, new market structure and market demand of the product. In such circumstances, though there is high potential market worldwide, production is declining.

While the dog chew is being exported in different logo/ brand by different producer/ exporter. Most of the chhurpi/ dog chew producers collect the milk cake in big flank shape from the farmers/or small entrepreneurs located at remote villages. It is not sure what process undertaken to produce such cakes. On the other hand, chhurpi processors do not have fixed operating procedure and are investing more money to make business bigger.

Chhurpi/ dog chew is one of the products to generate employment and collect urban capital to the very remote villages in Nepal. Regularizing the business properly could be an instrument to minimize the trade imbalance of Nepal.

6.2 Recommendations

Based on the study, for the market promotion of yak cheese and chhurpi both backward and forward value chain intervention required.

In backward value chain following suggestion/ recommendation are listed:

1. Alpine pasture regeneration: sustainable yak stocking rate and control grazing scheme.
2. Subsidized credit but no grant for scaling-up to the economically viable for certain time frame,
3. Separate government yak breeding station are required for two pure lines for yak and one pure line for Chauri (fertile female) and Jhopka (infertile male) production to ensure immediate milk and required animal along lower altitude trekking routes.
4. Indigenous livestock management systems should be strengthened as yak's ability to survive in harsh conditions and the people's ability to sustainably derive livelihood from it.
5. Research and development on yak husbandry are required to conserve yak through sustainable utilisation.
6. Being migratory obligation created by the climate in Himalayan region, Yak/Chauri move from one place to other at every 2 months interval namely Fagun and Chait, Baisakh and Jestha, Asar and Shrawan, Bhadra and Aswin, Kartik and Magsir and Push and Magh from high altitude to Low. In such circumstances, it is required to make sheds at such strategic location where Chauri/Yak stationed for two months period (2500-to-2600-meter height).
7. Periodic and proper vaccination towards getting FMD free zone campaign, reliable extension services along with AI, improvement in the pasture, proper housing, balance ration feeding, access to water for drinking, system for animal identification, adequate financing services and production-based grant to feed farmers could be tools to promote yak/chaury farming and increase productivity.

Forward value chain

Problem: sub-optimal product quality

It is already mentioned in this report that, quality of both yak cheese is sub-normal while the quality of chhurpi is not understood. Hence, it is required to develop proper manpower at different level for management, processing and marketing. Being perishable dairy products, it required to maintain cold chain at every step during production, ripening, transportation, storage and wholesale and retail counters. Subsidized solar panel generated electricity should be availed to the migratory herds for better quality cheese production and cow dung saving for revitalizing alpine pasture for optimal growth which, otherwise, would be used for cooking and heating.

Problem: Sub-optimal firm organization

Yak cheese production and its management are very costly. The farm sites are in the Himalayan region and risk is found at every level until the product reach to consumer kitchen. There is need to establish facilities at different stations until the product to reach in the market. It is seasonal business and only active for 6 months in a year. For the private sector, it is difficult to keep the manpower

intact. The business shall be well established if, it is tailored with tourism. During the winter tourist flow is very less while cheese production shall be done as yak/chaury migrate to lower altitude at that time. The milk production starts from June to July and ceased November to December when cheese production takes place. Thus, it may require mobile processing unit.

Problem: Inability of private producers to pool resources for generic advertising

Capital and human resource pooling and other promotional activities are crucial to operate for seasonal business. Only yak cheese production may not be sustainable, hence it is required to integrate the yak cheese/ chhurpi production with tourism. Cheese production season start from May to October and best season for tourism is October to December. From November to April, cheese production close. Hence, if private entrepreneur integrates this business with tourism, resource pooling shall be done.

Problem: Weak regulatory system in cheese/chhurpi production

In the context of increasing trend in chhurpi export, quality control and branding are utmost important. Similarly, there is no Standard Operating Procedure (SOP), Good Manufacturing Practice (GMP), Code of Conduct (CoC), Code of Practice (CoP) for chhurpi manufacturing chhurpi. Since primary level of processing is being done at village level collecting small quantity of milk, training on CoC, CoP, GMP and mentoring activities are to be implemented to assure the quality all level.

Problem: Cheese/chhurpi export in different label

Until now, it is being exported as ‘Dog Chew’ and exporting haphazardly. It is required to have common trademark, logo and specified quality of both yak cheese and chhurpi/dog chew. Trademark, brand name, branding, packaging and promotional activities are also not appropriately done. Regularizing the production and marketing of chhurpi by government owned agency and NDDB is the appropriate institution to take trademark and logo.

Problem: FMD free certification

Being a member country of WTO, SAARC, OIE, SPA, Codex BIMSTEC etc, it is essential FMD free certification to export. Until the date, the other member countries allow to export without FMD free certification, it may be due to the product for dog. They may ask this certificate if we tried to export chew for human purpose or even for dog chew too as the volume of export increased. Exercise for zoning the country, extensive vaccination program in selected zone and certification for FMD free in close coordination with above mentioned international institutions is recommended.

Problem: Difficulties to take trademark and export licencing

The cheese/producers are to be visited many government institutions in the course of taking trademark and licencing for export. Taking phyto-chemical test, disease pathogen test, trade promotion, technical support, tax, company registration and others. It is recommended to provide one door service for meaningful facilitation for export.

Problem: Data generation

It is very difficult to establish database of the product produced, milk used, domestic consumption and export of yak cheese and chhurpi. The code language for export of chhurpi mentioned in Nepal Foreign Trade Statistics is not clear. Data generation could be effective when it is generated by respective producers and provide to concern government agency. In such scenario, it is recommended to take trademark for yak cheese and chhurpi from DOI. NDDB shall distribute this trademark to cheese/chhurpi producers. Footing on this relation quality monitoring and data generation could be done by NDDB. For the purpose NDDB shall recruit an official having expertise in IT sector as a focal person.

Things to be done by NDDB to take trademark and distribution of mark:

To take the trademark and logo for yak cheese and chhurpi NDDB is to undertake following:

16. Organize workshop/meeting with the Chhurpi and Cheese producers in the country
17. Register yak cheese and chhurpi producers/ entrepreneurs in NDDB
18. Follow all the steps mentioned above for trademark registration
19. Design separate logo/trademark for yak cheese and chhurpi
20. Submission of an application for registration of a trademark to the DoI
21. Get registration certificate of the trademark
22. Inform all the Chhurpi and Cheese producers on taking the collective mark
23. Prepare Nepali Chhurpi and Cheese certification Trademark Implementation directive
24. Prepare code of conduct and terms to be followed by the trademark user
25. Prepare procedural guideline on using the Chhurpi/Cheese LOGO
26. Prepare strategy for export of Nepali Chhurpi/Cheese
27. Prepare standard Nepali and export quality of Nepali Chhurpi and Cheese
28. Monitoring of the manufacturing practices undertaken by the trademark/logo users
29. Regularise the trademark users
30. Promotional activities in and outside of the country

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ANNEXES

ANNEX-1 SAMPLE BUSINESS PLAN FOR MICRO YAK CHEESE AND CHHURPI ENTERPRIZE

Table: 1.1 General parameters undertaken to develop business plan

SN	Description	Yak cheese	Chhurpi
	Cheese processing plant		
1.1	Land (Ropani)	1	0.25
1.2	Factory building construction (Sq.ft)	300	100
1.3	Safety drainage construction (environment protection)	50	0
1.4	Water tank (Liter)	3000	small
2	Machinery and equipment	As listed in basic cash flow	As listed in basic cash flow
3.	Milk collection		
4	Total milk collection/day (average for 6 months for yak cheese 12 month for chhurpi months)	180	365
.1	Total goth (25/goth)	10	NA
4.2	Milk purchase rate (Rs	100	59
4.3	Milk collection period (Month)	6	12
5	Depreciation		
	a) Building	10%	10%
	b) Factory machinery/equipment	10%	10%
	c) Furniture/fixrture	20%	20%
	Manpower (No.)	3	3
	Average wages (Rs. Per month)	20000	12000
	Insurance (10 % of the cost for building and equipment)		
	Lumpsum for three staff	15000	15000
6	Cheese/Chhurpi production		
6.1	Cheese-chhurpi production (% of milk)	10	4.7%
7	Income norms :		
7.1	Sale of cheese (Rs/kg)	1600	850
7.2	Sale of butter (Rs/kg)	900	900
7.3	Sale of whey (Rs/lits)	1	1
8	Repayment norms:		
8.1	Repayment period (years)	2	2
8.2	Grace Period (years)	2 years	2 years
8.3	Interest rate(%)	12	12

Table: 1.2 Fixed assets investment for yak cheese in 000

	Particular	Qty	Rate (Rs)	Total
1	Land & Land Development (1 ropani @ Rs. 100000/ropani)	1	100.0	100
2	Building & Civil Works (300 sq ft @ Rs 2500)	300	2.5	750
3	Safety drainage construction (environment protection)	50	1.5	75
4	Water tank	3	75	225
5	Project Equipment	1	1,178	1,178
6	Office Equipment	1	10	10
7	Total Fixed Assets Investments			2,338
8	Working Capital Requirements			12221
9	Total Investments			16,897
	Financed By			
10	Equity			8,448
11	Loan			8,448
	Total			16,897

Table: 1.3 Fixed assets investment requirement for chhurpi production in '000

SN	Particular	Qty	Rate (Rs)	Total
1	Land & Land Development (0.25 ropani @ Rs. 100000/ropani)	0.25	100.0	25
2	Building & Civil Works (300 sq ft @ Rs 2500)	100	2.5	250
3	Project Equipment	1	430	430
4	Office Equipment/Furniture	1	5	5
5	Total Fixed Assets Investments			710
6	Working Capital Requirements			10832
7	Total Investments			12,252
	Financed By			
8	Equity			6,126
9	Loan			6,126
	Total			12,252

Table 1.4: Cost Table

Items	Units	Unit cost (NRs.)	Required Quantity	Total Cost (Quotes)	Shared to Eligible Items (Rs.)				Business contribution on Ineligible Items
					Equity	%	Loan	%	
Investment Costs									
Civil Works									
Cheese processing plant	sqft		-		-		-		
Land development	Ropani	100	1	100	50	50	50	50	
Factory building construction	Sqft	2.5	300	750	375	50	375	50	
Safety drainage construction (environment protection)	Sqft	1.5	50	75	38	50	38	50	
Water tank	lit	3	75	225	113	50	113	50	
Sub- Total			2	1,150	575	50	575	50	1,150
Machinery and Equipment			500						
Machinery/equipment	set	1,178	1	1,178	589	50	589	50	
Furniture/fixture	set	10	1	10	5	50	5	50	
Sub-Total	Nos		1	1,188	594	50	594	50	
Total Business Development Cost (NRs)				2,338	1,169	50	1,169	50	2,338
Grand Total				2,338	1,169	50	1,169	50	

Table: 1.5 Basic Cashflow Statement

Project on : Cheese production

Capacity: 500 lits/day

Litem	Unit	Unit Cost	Year=1	2	3	4	5	Year = 1	2	3	4	5	Total (NRs. '000)
		NRs'000	2023	2024	2025	2026	2027	2023	2024	2025	2026	2027	
Yak													
Investment Costs			Total Units/year					Total Amount /year					
Civil Works													
Cheese processing plant													-
Land development	Ropani	100	1					100					100
Factory building construction	Sq ft	2.5	300					750					750
Safety drainage construction (environment protection)	Sq ft	1.5	50					75					75
Water tank	Lit	75	3					225					225
Sub-Total								1,150	-	-	-	-	1,150
Machinery and Equipment													-
Cheese factory													
Machinery/equipment	Set	1,178	1					1,178					1,178
Furniture/fixture	Set	10	1					10					10

Litem	Unit	Unit Cost	Year=1	2	3	4	5	Year = 1	2	3	4	5	Total (NRs. '000)
		NRs'000	2023	2024	2025	2026	2027	2023	2024	2025	2026	2027	
Sub-Total								1,188	-	-	-	-	1,188
Total								2,338	-	-	-	-	2,338
Loan requested								1,169	-	-	-	-	1,169
Equity Offered								1,169	-	-	-	-	1,169
Annual Costs /Operating Cost													
Full Time Jobs													
Cheese boys	month	25	7	7	7	7	7	175	175	175	175	175	875
Sanitation assistant	month	10	7	7	7	7	7	70	70	70	70	70	350
Managing Director	month	25	7	7	7	7	7	175	175	175	175	175	875
Sub Total								420	420	420	420	420	2,100
Milk purchase	Lits	0.1	90,000	90000	90000	90000	90000	9,000	9,000	9,000	9,000	9,000	45,000
Renet	Gm	0.01	1,000	1,000	1,000	1,000	1,000	100	100	100	100	100	500
Cheese cloth	Meter	0.16	30	30	30	30	30	5	5	5	5	5	
Milk filter cloth	Meter	0.15	4	4	4	4	4	1	1	1	1	1	
Pipe	Meter	0.02	300	300	300	300	300	6	6	6	6	6	
Scarp	No	5	1	1	1	1	1	5	5	5	5	5	

Litem	Unit	Unit Cost	Year=1	2	3	4	5	Year = 1	2	3	4	5	Total (NRs. '000)
		NRs'000	2023	2024	2025	2026	2027	2023	2024	2025	2026	2027	
Cream store drum	No	1	10	10	10	10	10	10	10	10	10	10	
Butter store drum	No	1	10	10	10	10	10	10	10	10	10	10	
Culture box and associations	No	10	1	1	1	1	1	10	10	10	10	10	
Culture	Gm	0.012	100	100	100	100	100	1	1	1	1	1	
Tin box	No	3	1	1	1	1	1	3	3	3	3	3	
Thread	Kg	1	1	1	1	1	1	1	1	1	1	1	
Cheese mould	Nos	6	7	7	7	7	7	42	42	42	42	42	
Washing soda	Sack	3	2	2	2	2	2	6	6	6	6	6	
Shawel	No	1	1	1	1	1	1	1	1	1	1	1	
Toolbox	No	10	1	1	1	1	1	10	10	10	10	10	
Mobil	Lits	0.75	5	5	5	5	5	4	4	4	4	4	
Kerosine	Lits	0.11	10	10	10	10	10	1	1	1	1	1	
Cheese carry	Nos	5	3	3	3	3	3	15	15	15	15	15	
Cheese pakeging material	Kg	0.005	9,000	9,000	9,000	9,000	9,000	45	45	45	45	45	225
Sub Total								9,275	9,275	9,275	9,275	9,275	
Laboratory materials	Unit												

Litem	Unit	Unit Cost	Year=1	2	3	4	5	Year = 1	2	3	4	5	Total (NRs. '000)
		NRs'000	2023	2024	2025	2026	2027	2023	2024	2025	2026	2027	
Butyrometer	No	0.5	15	15	15	15	15	8	8	8	8	8	
Cork	No	0.1	15	15	15	15	15	2	2	2	2	2	
Milk/Alcohol/Acid Pipette	No	1	30	30	30	30	30	30	30	30	30	30	
Thermometer	NO	3	10	10	10	10	10	30	30	30	30	30	
Heavy meeth (Salt solution)	No	2	2	2	2	2	2	4	4	4	4	4	
Milk Sample bottle and stand	No	0.5	2	2	2	2	2	1	1	1	1	1	
Bottle rack	No	0.5	2	2	2	2	2	1	1	1	1	1	
Butyrometer stand	No	0.5	1	1	1	1	1	1	1	1	1	1	
Salt peter (sodium nitrate)	Kg	0.5	10	10	10	10	10	5	5	5	5	5	
Acid	Lis	0.09	30	30	30	30	30	3	3	3	3	3	
Alcohol	Lits	0.09	30	30	30	30	30	3	3	3	3	3	
Sub Total								86	86	86	86	86	
Gomboot	Set	0.6	4	4	4	4	4	2	2	2	2	2	
Apron	Set	1.0	4	4	4	4	4	4	4	4	4	4	
Cap	No	0.1	45	45	45	45	45	5	5	5	5	5	
Sub Total								11	11	11	11	11	

Litem	Unit	Unit Cost	Year=1	2	3	4	5	Year = 1	2	3	4	5	Total (NRs. '000)
		NRs'000	2023	2024	2025	2026	2027	2023	2024	2025	2026	2027	
Sub Total								9,372	9,372	9,372	9,372	9,372	45,725
Fuel Water, Waste etc													
Firewood	Unit	0.01	1,500	1,500	1,500	1,500	1,500	15	15	15	15	15	75
Water	Unit	0.02	1,500	1,500	1,500	1,500	1,500	30	30	30	30	30	150
Vehicle hired	Days	12	360	360	360	360	360	4,320	4,320	4,320	4,320	4,320	21,600
Sub-Total							\	4,365	4,365	4,365	4,365	4,365	21,825
Maintenance Costs													
Maintenance of buildings	L/S	10	1	1	1	1	1	10	10	10	10	10	50
Maintenance of fencing	L/S	5	1	1	1	1	1	5	5	5	5	5	25
Maintenance of Equipment's	L/S	10	1	1	1	1	1	10	10	10	10	10	50
Sub-Total								25	25	25	25	25	125
Other Costs													
Communication	month	3	6	6	6	6	6	18	18	18	18	18	90
Stationary	month	1	6	6	6	6	6	6	6	6	6	6	30
Transportation	month	5	6	6	6	6	6	30	30	30	30	30	150
Sub-Total								54	54	54	54	54	270
Insurance premium													

Litem	Unit	Unit Cost	Year=1	2	3	4	5	Year = 1	2	3	4	5	Total (NRs. '000)
		NRs'000	2023	2024	2025	2026	2027	2023	2024	2025	2026	2027	
Insurance of building and Equipment	annual	234	1	1	1	1	1	234	234	234	234	234	1,169
Insurance of the staff members	annual	15	1	1	1	1	1	15	15	15	15	15	75
Sub-Total								234	234	234	234	234	1,169
Interest on loan @12%								140	140	140	105	35	
Principle payment										292	585	292	
Sub Total								140	140	433	690	327	
Sub Total								478	478	770	1,028	665	1,639
Total Annual Costs								14,559	14,559	14,559	14,559	14,559	71,214
Annual Revenues								12,221					
Main Products and Services													
Sales of cheese	Kg	1.6	9,000	9,000	9,000	9,000	9,000	14,400	14,400	14,400	14,400	14,400	72,000
Sale of butter	Kg	0.9	3600	3600	3600	3600	3600	3,240	3,240	3,240	3,240	3,240	16,200
Sub-Total								17,640	17,640	17,640	17,640	17,640	88,200
Total Annual Revenues								17,640	17,640	17,640	17,640	17,640	88,200
Net Annual Cash Flows								3,081	3,081	3,081	3,081	3,081	16,986

Table: 1.6 Profit and Loss Account

	Value/Year					
	Year	1	2	3	4	5
Total Annual Revenues		17,640	17,640	17,640	17,640	17,640
Value Added Tax		0	0	0	0	0
Net Revenue		17,640	17,640	17,640	17,640	17,640
Total Annual Costs		14,559	14,559	14,559	14,559	14,559
Operating Profit		3,081	3,081	3,081	3,081	3,081
Depreciation		312	312	312	312	312
Profit Before Finance Charges		2,769	2,769	2,769	2,769	2,769
Finance Charges		-	-	-	-	-
Profit Before Tax		2,769	2,769	2,769	2,769	2,769
Tax @13% VAT +2% Service tax		415	415	415	415	415
Net Profit		2,354	2,354	2,354	2,354	2,354
Dividends Paid 20% of Net Profit		471	471	471	471	471
Retained Earnings		1,883	1,883	1,883	1,883	1,883
Total Investment		2,338	-	-	-	-
Ratio Analysis						

	Value/Year					
	Year	1	2	3	4	5
Return on Investment (ROI) %		13.93				
Gross margin (GM) %		21.16				
Operating profit margin (OPM) %		17.47				
Net profit (NP) %		13.34				
Payback Period (PbP) year		1.24				
Basis for Calculation						
ROI= Net profit/ Total Annual cost (Investment+ operating)*100						
GM= (Total Annual Revenue -Total Annual Cost)/Total Annual Cost*100						
OPM= Operating profit/total revenue*100						
NP = Net profit/ Total Revenue*100						
PbP = Total investment/Cash reserve						

Table: 1.7 Balance Sheet

Assets	Year =1	2	3	4	5
Current Assets					
Cash	1,883	1,883	1,883	1,883	1,883
Accounts Receivable Advances to Suppliers Inventory					
Raw Materials – milk					
Finished Goods- cheese			682	938	1,193
Others					
Total Current Assets	1,883	1,883	2,565	2,821	3,076
Long Term Assets					
Fixed Assets	1,150	838	526	214	(98)
Less Accumulated Depreciation	312	312	312	312	312

Assets	Year =1	2	3	4	5
Net Fixed Assets	838	526	214	(98)	(411)
All Long Term Assets	838	526	214	(98)	(411)
Total Assets	2,721	2,409	2,779	2,723	2,665
Liabilities					
Current Liabilities					
Accounts payable	-	-	-	-	-
Short-term loans	-	-	-	-	-
Income taxes payable	415	415	415	415	415
Accrued salaries and wages	420	420	420	420	420
Unearned revenue	-	-	-	-	-
Current portion of long-term debt	-	-	-	-	-
Total Current Liabilities	835	835	835	835	835
Long-term Liabilities					
Staff provided fund@10% of the Salary	504	504	504	504	504
Insurance Premium	234	234	234	234	234
Specify	-	-	-	-	-
Total Long-term Liabilities	738	738	738	738	738
Total Liabilities	1,573	1,573	1,573	1,573	1,573
Equity					
Investment Equity	1,169	1,169	1,169	1,169	1,169
Retained Earnings	1,883	1,883	1,883	1,883	1,883
Other Equity	505	357	-	-	-
Total Equity	3,557	3,409	3,052	3,052	3,052
Total Liabilities and Equity	5,130	4,982	4,625	4,625	4,625
Ratio Analysis					
Debt Ratio = (Total Liabilities / Total Assets)	0.58				

Assets	Year =1	2	3	4	5
Current Ratio = (Current Assets / Current Liabilities)	2.25				
Working Capital = (Current Assets - Current Liabilities)	1,048				
Assets-to-Equity Ratio = (Total Assets / Owner's Equity)	0.76				
Debt-to-Equity Ratio = (Total Liabilities / Owner's Equity)	0.44				
Revenue/Fixed Assets (%)	1533.91				
Return on Assets (%)	648.33				
Debt / Equity Ratio	1.00				

Table 1.8: Depreciation Calculation

Depreciation on fixed assets			Year= 0	1	2	3	5	Year=0	1	2	3	4
Depreciation on Buildings	Year	75	1	1	1	1	1	75	75	75	75	75
Depreciation on Equipment's	Year	237	1	1	1	1	1	237	236.60	236.60	236.60	236.60
Depreciation on Furniture	Year	1	1	1	1	1	1	1	0.5	0.5	0.5	0.5
Sub-Total								312	312	312	312	312

Table: 1.9 Internal Rate of Return

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Total Annual Revenue	-	17,640	17,640	17,640	17,640	88,200
Total Annual Cost	14,559	14,559	14,559	14,559	14,559	71,214
Depreciation	312	312	312	312	312	312
	(14,247)	3,393	3,393	3,393	3,393	17,298
IRR	24%					

Business scheme: Chhurpi Production

Table: 1.10 Cost Table

Items	Units	Unit cost (NRs.)	Required Quantity	Total Cost (Quotes)	Shared to Eligible Items (Rs.)				Business contribution on Ineligible Items
					Equity	%	Loan	%	
Investment Costs									
Civil Works									
Chhurpi processing plant	sqft		-		-		-		
Land development	Ropani	100	0.5	50	25	50	25	50	
Factory building construction	Sqft	2.5	100	250	125	50	125	50	
Sub- Total			2	300	150	50	150	50	300
Machinery and Equipment			500						
Machinery/equipment	set	430	1	430	215	50	215	50	
Furniture/fixture	set	5	1	5	3	50	3	50	
Sub-Total	Nos		1	435	218	50	218	50	
Total Business Development Cost (NRs)				735	368	50	368	50	735
Grand Total				735	368	50	368	50	

Table: 1.11 Basic Cashflow Statement

Project on : Chhurpi production

Capacity: 500 lits/day

Litem	Unit	Unit Cost	Year=1	2	3	4	5	Year = 1	2	3	4	5	Total (NRs. '000)
		NRs'000	2022	2023	2024	2025	2026	2022	2023	2024	2025	2026	
Investment Costs			Total Units/year					Total Amount /year					
Civil Works													
Cheese processing plant													-
Land development	Ropani	100	0.25					25					25
Factory building construction	Sq ft	2.5	100					250					250
Sub-Total								275	-	-	-	-	275
Machinery and Equipment													-
Cheese factory													
Machinery/equipment	Set	430	1					430					430
Furniture/fixture	Set	5	1					5					5
Sub-Total								435	-	-	-	-	435
Total								710	-	-	-	-	710
Loan								355	-	-	-	-	355
Equity Offered								355	-	-	-	-	355
Annual Costs /Operating Cost													
Full Time Jobs													

Litem	Unit	Unit Cost	Year=1	2	3	4	5	Year = 1	2	3	4	5	Total (NRs. '000)
		NRs'000	2022	2023	2024	2025	2026	2022	2023	2024	2025	2026	
Chhurpi maker (Part-time)	month	12	12	12	12	12	12	144	144	144	144	144	720
Accountant (Part-time)	month	12	12	12	12	12	12	144	144	144	144	144	720
Sanitation assistant (Part-time)	month	8	12	12	12	12	12	96	96	96	96	96	480
Sub Total								384	384	384	384	384	1,920
Milk purchase	Lits	0.059	180,000	180,000	180,000	180,000	180,000	10,620	10,620	10,620	10,620	10,620	53,100
Renet	Gm	0.01	1,000	1,000	1,000	1,000	1,000	59	59	59	59	59	295
Chhurpi cloth	Meter	0.16	30	30	30	30	30	5	5	5	5	5	
Milk filter cloth	Meter	0.15	4	4	4	4	4	1	1	1	1	1	
Cream store drum	No	1	10	10	10	10	10	10	10	10	10	10	
Butter store drum	No	1	10	10	10	10	10	10	10	10	10	10	
Chhurpi mold	Nos	6	7	7	7	7	7	42	42	42	42	42	
Chhurpi pakeging material	Kg	0.005	8,460	8,460	8,460	8,460	8,460	42	42	42	42	42	212
Sub Total								10,789	10,789	10,789	10,789	10,789	
Laboratorymaterials	Unit												
Butyrometer	No	0.5	5	5	5	5	5	3	3	3	3	3	
Cork	No	0.1	5	5	5	5	5	1	1	1	1	1	
Milk/Alcohol/Acid Pipette	No	1											

Litem	Unit	Unit Cost	Year=1	2	3	4	5	Year = 1	2	3	4	5	Total (NRs. '000)
		NRs'000	2022	2023	2024	2025	2026	2022	2023	2024	2025	2026	
			10	10	10	10	10	10	10	10	10	10	
Thermometer	No	3	5	5	5	5	5	15	15	15	15	15	
Milk Sample bottle and stand	No	0.5	2	2	2	2	2	1	1	1	1	1	
Bottle rack	No	0.5	2	2	2	2	2	1	1	1	1	1	
Butyrometer stand	No	0.5	1	1	1	1	1	1	1	1	1	1	
Acid	Lis	0.09	10	10	10	10	10	1	1	1	1	1	
Alcohol	Lits	0.09	10	10	10	10	10	1	1	1	1	1	
Sub Total								32	32	32	32	32	
Gumboot	Set	0.6	4	4	4	4	4	2	2	2	2	2	
Apron	Set	1.0	4	4	4	4	4	4	4	4	4	4	
Cap	No	0.1	45	45	45	45	45	5	5	5	5	5	
Sub Total								11	11	11	11	11	
Sub Total								10,832	10,832	10,832	10,832	10,832	53,607
Fuel Water, Waste etc													
Firewood	Unit	0.01	1,500	1,500	1,500	1,500	1,500	15	15	15	15	15	75
Water	Unit	0.02	1,500	1,500	1,500	1,500	1,500	30	30	30	30	30	150
Sub-Total							\	45	45	45	45	45	225

Litem	Unit	Unit Cost	Year=1	2	3	4	5	Year = 1	2	3	4	5	Total (NRs. '000)
		NRs'000	2022	2023	2024	2025	2026	2022	2023	2024	2025	2026	
Maintenance Costs													
Maintenance of buildings	L/S	5	1	1	1	1	1	5	5	5	5	5	25
Maintenance of Equipment	L/S	5	1	1	1	1	1	5	5	5	5	5	25
Sub-Total								10	10	10	10	10	50
Other Costs													
Communication	month	2	12	12	12	12	12	24	24	24	24	24	120
Stationary	month	0.5	12	12	12	12	12	6	6	6	6	6	30
Transportation	month	5	12	12	12	12	12	60	60	60	60	60	300
Sub-Total								90	90	90	90	90	450
Insurance premium													
Insurance of building and Equipment	annual	71	1	1	1	1	1	71	71	71	71	71	355
Insurance of the staff members	annual	15	1	1	1	1	1	15	15	15	15	15	75
Sub-Total								71	71	71	71	71	355
Interest on loan @12%								43	43	32	21	11	
Principle payment										89	178	89	
Sub Total								43	43	121	199	99	
Total Annual Costs								11,474	11,474	11,552	11,631	11,531	56,607
Annual Revenues													

Litem	Unit	Unit Cost	Year=1	2	3	4	5	Year = 1	2	3	4	5	Total (NRs. '000)
		NRs'000	2022	2023	2024	2025	2026	2022	2023	2024	2025	2026	
								10,764					
Main Products and Services													
Sales of cheese	Kg	0.85	8,460	8,460	8,460	8,460	8,460	7,191	7,191	7,191	7,191	7,191	35,955
Sale of butter	Kg	0.9	7200	7200	7200	7200	7200	6,480	6,480	6,480	6,480	6,480	32,400
Sub-Total								13,671	13,671	13,671	13,671	13,671	68,355
Total Annual Revenues								13,671	13,671	13,671	13,671	13,671	68,355
Net Annual Cash Flows								2,197	2,197	2,119	2,041	2,140	11,749

Table: 1.12 Profit and Loss Account

	Value/Year					
	Year	1	2	3	4	5
Total Annual Revenues		13,671	13,671	13,671	13,671	13,671
Value Added Tax		1777.23	1777.23	1777.23	1777.23	1777.23
Net Revenue		11,894	11,894	11,894	11,894	11,894
Total Annual Costs		11,474	11,474	11,552	11,631	11,531
Operating Profit		419	419	341	263	363
Depreciation		112	112	112	112	112
Profit Before Finance Charges		308	308	230	152	251
Finance Charges		-	-	-	-	-
Profit Before Tax		308	308	230	152	251
Tax @13% VAT +2% Service tax		46	46	34	23	38

	Value/Year					
	Year	1	2	3	4	5
Net Profit		262	262	195	129	213
Dividends Paid 20% of Net Profit		52	52	39	26	43
Retained Earnings		209	209	156	103	171
Total Investment		710	-	-	-	-
Ratio Analysis						
Return on Investment (ROI) %		2.15				
Gross margin (GM) %		19.14				
Operating profit margin (OPM) %		3.07				
Net profit (NP) %		1.91				
Payback Period (PbP) year		3.39				
Basis for Calculation						
ROI= Net profit/ Total Annual cost (Investment+ operating)*100						
GM= (Total Annual Revenue -Total Annual Cost)/Total Annual Cost*100						
OPM= Operating profit/total revenue*100						
NP = Net profit/ Total Revenue*100						
PbP = Total investment/Cash reserve						

Table: 1.13 Balance Sheet

Assets	Year =1	2	3	4	5
Current Assets					
Cash	209	209	209	209	209
Accounts Receivable Advances to Suppliers Inventory					
Raw Materials - milk					
Finished Goods- cheese			682	938	1,193
Others					
Total Current Assets	209	209	891	1,147	1,402
Long Term Assets					
Fixed Assets	275	163	52	(60)	(172)
Less Accumulated Depreciation	112	112	112	112	112
Net Fixed Assets	163	52	(60)	(172)	(284)
All Long Term Assets	163	52	(60)	(172)	(284)
Total Assets	372	261	831	975	1,118
Liabilities					
Current Liabilities					
Accounts payable	-	-	-	-	-
Short-term loans	-	-	-	-	-
Income taxes payable	46	46	34	23	38
Accrued salaries and wages	384	384	384	384	384
Unearned revenue	-	-	-	-	-
Current portion of long-term debt	-	-	-	-	-
Total Current Liabilities	430	430	418	407	422
Long-term Liabilities					
Staff providend fund@10% of the Salary	461	461	461	461	461
Insurance Premiun	71	71	71	71	71

Assets	Year =1	2	3	4	5
Specify	-	-	-	-	-
Total Long-term Liabilities	532	532	532	532	532
Total Liabilities	962	962	950	939	953
Equity					
Investment Equity	368	368	368	368	368
Retained Earnings	209	209	156	103	171
Other Equity	505	357	-	-	-
Total Equity	1,082	934	524	471	538
Total Liabilities and Equity	2,044	1,896	1,474	1,409	1,492
Ratio Analysis					
Debt Ratio = (Total Liabilities / Total Assets)	2.58				
Current Ratio = (Current Assets / Current Liabilities)	0.49				
Working Capital = (Current Assets - Current Liabilities)	(221)				
Assets-to-Equity Ratio = (Total Assets / Owner's Equity)	0.34				
Debt-to-Equity Ratio = (Total Liabilities / Owner's Equity)	0.89				
Revenue/Fixed Assets (%)	4971.27				
Return on Assets (%)	3670.07				
Debt / Equity Ratio	1.00				

Table 1.14: Depreciation Calculation

Depreciation on fixed assets			Year= 0	1	2	3	5	Year=0	1	2	3	4
Depreciation on Buildings	year	25	1	1	1	1	1	25	25	25	25	25
Depreciation on Equipment's	year	87	1	1	1	1	1	87	86.50	86.50	86.50	86.50
Depreciation on Furniture	year	0	1	1	1	1	1	0	0.25	0.25	0.25	0.25
Sub-Total								112	112	112	112	112

Table: 1.15 Internal Rate of Return

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Total Annual Revenue	-	13,671	13,671	13,671	13,671	68,355
Total Annual Cost	11,474	11,474	11,552	11,631	11,531	56,607
Depreciation	112	112	112	112	112	112
	(11,363)	2,308	2,230	2,152	2,252	11,860
IRR	18%					

ANNEX: 2 :THE SURVEY TOOLS

Annex: 2.1 HH Survey

नेपालमा याक चिज र छुर्पिको बजार प्रवर्द्धन, ब्राण्डिङ्ग र निर्यात सम्बन्धि अध्ययन *Study on market promotion and branding of Yak cheese and Chhurpi for export*

राष्ट्रिय दुग्ध विकास बोर्ड तथा नेपाल वातावरण संरक्षण केन्द्र

दुध उत्पादकहरुको लागि घरधुरी सर्भेक्षण

घरमुलीको नाम:.....उत्तरदाताको नाम:.....जिल्ला:.....प्रदेश:.....

लिङ्ग:..... उमेर (वर्ष):..... पेशा:.....

उत्तरदाताको शिक्षा: क) निरक्षर ख) साक्षर ग) प्राथमीक घ) माध्यमिक ङ) उच्च माध्यमिक च) स्नातक वा वदी

परिवार संख्या.....महिला..... पुरुष.....

१. तपाईंको गोठमा कतिवटा याक/नाक/चौरी गाई/भैसी छन् ? क) गाई..... ख) भैसी.....

२. तपाईंको गोठमा कतिवटा दुध दिने गाई/भैसी छन् ?क) गाई.....ख) भैसी.....ग) याक/नाक/चौरी.....

३. भएका गाई भैसीको प्रकार:

गाई क) स्थानीय ख) क्रस ग) विकासे

भैसी क) स्थानीय ख) क्रस ग) विकासे

४. प्रति जनावर वार्षिक दूध उत्पादन (लि)

विवरण	गाई	भैसी	याक/नाक/चौरी
दूध लिटरमा			
दुध दिने महिना संख्या			
दूध दिने जनावर संख्या			

५. विगत देखि हाल सम्मको दूध उत्पादन (लि) को वार्षिक परिमाण बताउनुहोस ।

विवरण	हाल			५ वर्ष पहिले			१० वर्ष पहिले		
	जम्मा संख्या	दूध दिने संख्या	उत्पादन	जम्मा संख्या	दूध दिने संख्या	उत्पादन	जम्मा संख्या	दूध दिने संख्या	उत्पादन
गाई									
भैसी									
याक/नाक/चौरी									

६. हाल दूधको प्रयोग (लि)

विवरण	गाई	भैसी	याक/नाक/चौरी
घरमा खाने			
वेच्ने			
वाड्ने			

७. दुधको वजार

विवरण	गाई	भैसी	याक/नाक/चौरी
घर घर डुलाउने			
स्थानीय बजार			
छुर्पि उद्योग			
चिज उद्योग			
अन्य दुग्ध उद्योग			

८. दूध वेच्ने भए कसलाई बेच्न रुचाउनुहुन्छ ? र किन

विवरण	गाई	भैसी	याक/नाक/चौरी	किन ?
घर घर डुलाउने				
स्थानीय बजार				
छुर्पि उद्योग				
चिज उद्योग				
अन्य दुग्ध उद्योग				

९. दुध उत्पादन खर्च र विक्रिवाट हुने आम्दानी भन्नुहोस (वार्षिक)

जनावर	खर्च	आम्दानी	कैफियत
गाई			
भैसी			
याक/नाक/चौरी			

१०. गाई, भैसी, याक/नाक/चौरी पालन गर्दा तपाईंले भोगेका समस्या र समाधानका उपाय बताउनुहोस ।

जनावर	समस्या	समाधान कसरी हुन्छ ?
गाई		
भैसी		
याक/नाक/चौरी		

११. के भयो भने तपाईं गाई, भैसी, याक/नाक/चौरी वढी पाल्नु हुन्छ ?

Annex: 2.2 Key Informant Interview (Producer)

नेपालमा याक चिज र छुर्पिको बजार प्रवर्द्धन, ब्राण्डिङ्ग र निर्यात सम्बन्धि अध्ययन

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राष्ट्रिय दुग्ध विकास बोर्ड तथा नेपाल वातावरण संरक्षण केन्द्र

मुख्य सूचनादाताहरूको लागि अन्तर्वार्ता (चिज, छुर्पि उत्पादकको लागि)

नाम:..... संस्था:..... पद:.....
ठेगाना:..... सम्पर्क नम्बर:.....

१. हाल तपाईंको कारखाना/वरपर/जिल्लामा कति चिज र छुर्पि उत्पादन भई रहेको छ ? यो उत्पादन विगत ५/१० वर्षको तुलनामा कस्तो हो ? परिमाण र बजार मूल्यको आधारमा भन्नुहोस ।

२. याक चिज र छुर्पि तयार गर्दा लाग्ने खर्चको विवरण भन्नुहोस ।

खर्च विवरण	आवश्यक सामग्री	परिमाण	बजार मूल्य (रु)	कैफियत
सञ्चालन क्षमता (लि)				
(क) पुजीगत खर्च				
	जमीन र जमीनको तयारी			
	कारखाना निर्माण			
(ख) मेसिन/उपकरण				
१	क्रिम सेपरेटर			
२	चिलिङ्ग भ्याट			
३	चिज भ्याट			
४	डेनेज भ्याट			
५	स्टोरेज टंकी			
६	चिज केटली			
७	चिज हार्प			
८	मोल्ड/चिज प्रेस			
९	मोल्ड ह्याडेलिङ्ग कभर हटाउने, ब्लोईङ्ग प्रणाली			
१०	मोल्ड ट्रान्सपोर्ट प्रणाली			
११	चिज हण्डलिङ्ग (पाराफिन, कोटिङ्ग)			

खर्च विवरण	आवश्यक सामग्री	परिमाण	वजार मूल्य (रु)	कैफियत
	भ्याकुम प्याकिङ्ग)			
१२	ह्वे प्रोसेसिङ्ग			
१३	मिल्क क्यान			
१४	दुवानी साधन			
१५	फर्निचर, फिक्सचर			
(ग) सञ्चालन सामग्री				
१	दुध			
२	जोरन/रेनेट			
३	नून			
४	चीज क्लोथ			
५	डिटरजेन्ट			
६	प्याकेजिङ्ग सामग्री			
७	ग्लासवेयर			
८	केमिकल्स			
९	प्रयोशाला सामग्री			
(घ) स्थीर खर्च				
१	कर्मचारी तलब भत्ता			
२	पानी			
३	वक्ति			
४	डिजेल			
५	दाउरा			
६	विमा			
७	मर्मत सम्भार			
८	अडिट खर्च			
९	नविकरण			
१०	व्याज भुक्तानी			
(ड) वजार व्यवस्थापन	दुवानी			
१	प्रचार प्रसार			
२	चिज भण्डारण (कोल्ड स्टोर खर्च)			

३. प्रति सय लिटर दुधवाट वन्ने (के.जी)

चिज	
छुर्पि	

४. चिज/ छुर्पिवाट हुने आम्दानी

क्र.स	उत्पादन हुने वस्तु	परिमाण (के.जी)	दर (रु)	जम्मा रु
१	चिज			
२	छुर्पि			
३	ह्वे			

६. उत्पादन भएको चिज/छुर्पि कहाँ बेच्नुहुन्छ ?

७. बजार विस्तार गर्न सक्ने अवस्था कस्तो छ ? कुन कुन क्षेत्रमा बढाउन सकिन्छ ?

८. बजार विस्तारको लागि देखिएका मुख्य मुख्य समस्या के के हुन ?

९. चिज र छुर्पिको दीगो बजार विस्तारको लागि के के कुरामा ध्यान दिनुपर्छ ? कसको जिम्मेवारी के के हुनुपर्छ ?

क्र.स	निकाय	जिम्मेवारी	कैफियत
१	नेपाल सरकार		
२	प्रदेश सरकार		
३	स्थानीय तह		
४	चिज/छुर्पि उत्पादक		
५	चिज/छुर्पि भण्डार गर्ने कोल्ड स्टोर		
६	निर्यातकर्ता		
७	वितरक		
८	होल सेलर		
९	रिटेलर		
१०	दुध उत्पादक किसान		
११	पशु प्रसार सेवा प्रदायक		
१२	दुध उत्पादन सामग्री		

क्र.स	निकाय	जिम्मेवारी	कैफियत
	प्रदायक		
१३	वित्तीय सेवा प्रदायक		
१४	विमा सेवा प्रदायक		
१५	अनुसन्धान गर्ने संस्था		

१०. नेपालमा उत्पादन हुने चिज तथा छुर्पिको सामुहिक ब्रेडमार्क प्राप्तिको लागि के के गर्नु पर्ला ?

११. नेपालमा दुध र दुग्ध पदार्थ (खास गरी चिज र छुर्पि) उत्पादन, वस्तु विवधिरण, प्रवर्द्धन र ब्राण्डिङ्ग सम्बन्धमा कायम रहेका ऐन, कानून, नीति, नियम के के छन् ?

१२. तपाईंलाई दुध र दुग्ध पदार्थ (खास गरी चिज र छुर्पि) उत्पादन, वस्तु विवधिरण, प्रवर्द्धन र ब्राण्डिङ्ग सम्बन्धमा codex, OIE code, SPS सम्झौता, राष्ट्रिय कानूनी अवस्था र यसको कार्यान्वयन अवस्था कस्तो लाग्छ ?

१३. तपाईंले थाहा पाए अनुसार कुन कुन ठाउँमा चिज र छुर्पि उत्पादन हुने गरेको छ ? तिनिहरुको नाम र ठेगाना बताई दिनुहोस ।

क्र.स	चिज उत्पादकको नाम र ठेगाना	सम्पर्क व्यक्ति र नम्बर	छुर्पि उत्पादकको नाम र ठेगाना	सम्पर्क व्यक्ति र नम्बर

१४. तपाईंलाई जानकारी भए अनुसार चीज/छुर्पि उद्योग वा घरमै उत्पादन गर्ने उत्पादकहरुले कति दुध खपत गर्दछन् र कति चीज/छुर्पि उत्पादन गर्दछन् ?

क्र.स	दुध खपत	चिज उत्पादन (के.जी)	छुर्पि उत्पादन (के.जी)

१५. तपाईंलाई थाहा भए अनुसार याक चिज र छुर्पि ग्रेडिङ्ग गरि उत्पादन गर्नेहरु कति छन् जस्तो लाग्छ ?
चिज:..... छुर्पि:.....

१५. खाद्य प्रविधि तथा गुण नियन्त्रण विभागबाट तपाईंको उत्पादन परीक्षण भएको भए चिज/छुर्पिको भौतिक र रासायनिक गुणहरु दिनुहोस ।

१६. मुलुक बाहिर चीज र छुर्पि उत्पादन र बजारीकरण गर्ने कार्यमा लागेकाहरु कति होलान ? बताईदिनुहोस ।

१७. नेपालबाट विदेश तर्फ चीज र छुर्पि निर्यात गर्ने संघ, संस्था, व्यापारीहरुको नाम, ठेगाना र निर्यात गर्ने परिमाण बताईदिनुहोस ।

क्र.स	चीज निर्यात गर्ने (संघ, संस्था, व्यक्ति)	छुर्पि निर्यात गर्ने (संघ, संस्था, व्यक्ति)

१८. चीज र छुर्पि उत्पादन, भण्डारण, सीतभण्डार, गुण नियन्त्रण, बजार व्यवस्थापन, विविधिकरण र निर्यात प्रवर्द्धन (खास गरी मानव समसाधन र व्यवस्थापकीय क्षमता) विकास गर्न आवश्यक ज्ञान र सीप अभिवृद्धि गर्न के के गर्नु पर्ला ?

१९. याक चीज र छुर्पिको लागि सामुहिक ट्रेडमार्क लिई राष्ट्रिय, अन्तराष्ट्रिय बजार प्रवर्द्धन गर्न के के गर्नु पर्ला ?

धन्यवाद

Annex: 2.3 Key Informant Interview (Marketer)

नेपालमा याक चिज र छुर्पिको बजार प्रवर्द्धन, ब्राण्डिङ्ग र निर्यात सम्बन्धि अध्ययन

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मुख्य सूचनादाता-वजारीकरण गर्ने हरुको लागि अन्तर्वार्ता

नाम:..... संस्था..... पद.....,
ठेगाना..... सम्पर्क नम्बर.....

१. नेपालमा याक चिज तथा छुर्पि मूल्य श्रृंखलाका मुख्य मुख्य पात्रहरु को को हुन ?

२. हाल तपाईंको कारखाना/वरपर/जिल्लामा कति चिज र छुर्पि उत्पादन भई रहेको छ ? यो उत्पादन विगत ५/१० वर्षको तुलनामा कस्तो हो ? परिमाण र बजार मुल्यको आधारमा भन्नुहोस ।

३. कुन कुन स्थान/ मुलुकबाट कति कति माग भई आउने गर्छ ? माग अनुसार आपूर्ति गर्न सक्नु भएको छ ? नसकेको भए कति प्रतिशत माग पूरा गर्नुभएको छ ?

४. बजार विस्तार गर्न सक्ने अवस्था कस्तो छ ? कुन कुन क्षेत्रमा वढाउन सकिन्छ ? बजार विस्तारको लागि देखिएका मुख्य मुख्य समस्या के के हुन ?

५. चिज र छुर्पिको दीगो बजार बजार विस्तारको लागि के के कुरामा सुधार दिनुपर्छ ? कसको जिम्मेवारी के के हुनुपर्छ ?

क्र.स	निकाय	जिम्मेवारी	कैफियत
१	नेपाल सरकार		
२	प्रदेश सरकार		
३	स्थानीय तह		
४	चिज/छुर्पि उत्पादक		
५	चिज/छुर्पि भण्डार गर्ने कोल्ड स्टोर		
६	निर्यातकर्ता		
७	वितरक		
८	होल सेलर		
९	रिटेलर		
१०	दुध उत्पादक किसान		
११	पशु प्रसार सेवा प्रदायक		

क्र.स	निकाय	जिम्मेवारी	कैफियत
१२	दुध उत्पादन सामग्री प्रदायक		
१३	वित्तिय सेवा प्रदायक		
१४	विमा सेवा प्रदायक		
१५	अनुसन्धान गर्ने संस्था		

६. चिज/छुर्पिको मूल्य बजारमा कति पर्छ ?

क) होल सेल

ख) रिटेल

७. नेपालमा उत्पादन हुने चिज तथा छुर्पिको सामुहिक ट्रेडमार्क प्राप्तिको बारे तपाईंको धारणा के हो ? यदि लिनु पर्छ जस्तो लाग्छ भने त्यसको लागि के के गर्नु पर्ला ?

९. तपाईंलाई दुध र दुग्ध पदार्थ (खास गरी चिज र छुर्पि) उत्पादन, वस्तु विवधिरण, प्रवर्द्धन र ब्राण्डिङ्ग सम्बन्धमा codex, OIE code, SPS सम्झौता, राष्ट्रिय कानूनी अवस्था र यसको कार्यान्वयन अवस्था कस्तो लाग्छ ?

१०. तपाईं कुन कुन ठाउँमा चिज र छुर्पि खरिद गर्नुहुन्छ ? तिनीहरूको नाम र ठेगाना बताई दिनुहोस ।

क्र.स	चिज उत्पादकको नाम र ठेगाना	सम्पर्क व्यक्ति र नम्बर	छुर्पि उत्पादकको नाम र ठेगाना	सम्पर्क व्यक्ति र नम्बर

११. तपाईंलाई थाहा भए अनुसार याक चिज र छुर्पि ग्रेडिङ्ग गरि उत्पादन गर्नेहरू कति छन् जस्तो लाग्छ ?

चिज:..... छुर्पि:.....

१२. मुलुक बाहिर चिज र छुर्पि उत्पादन र बजारीकरण गर्ने कार्यमा लागेकाहरू कति होलान ? बताईदिनुहोस ।

१३. नेपालबाट विदेश तर्फ चिज र छुर्पि निर्यात गर्ने संघ, संस्था, व्यापारीहरूको नाम, ठेगाना र निर्यात गर्ने परिमाण बताईदिनुहोस ।

क्र.स	चीज निर्यात गर्ने (संघ, संस्था, व्यक्ति)	छुर्पि निर्यात गर्ने (संघ, संस्था, व्यक्ति)

१४. चीज र छुर्पि उत्पादन, भण्डारण, सीतभण्डार, गुण नियन्त्रण, वजार व्यवस्थापन, विविधिकरण र निर्यात प्रवर्द्धन (खास गरी मानव समसाधन र व्यवस्थापकीय क्षमता) विकास गर्न आवश्यक ज्ञान र सीप अभिवृद्धि गर्न के के गर्नु पर्ला ?

१५. याक चिज र छुर्पिको लागि सामुहिक ट्रेडमार्क लिई राष्ट्रिय, अन्तराष्ट्रिय वजार प्रवर्द्धन गर्न के के गर्नु पर्ला ?

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Annex: 2.4 Key Informant Interview (General KI)

नेपालमा याक चिज र छुर्पिको बजार प्रवर्द्धन, ब्राण्डिङ र निर्यात सम्बन्धि अध्ययन *Study on market promotion and branding of Yak cheese and Chhurpi for export*

राष्ट्रिय दुग्ध विकास बोर्ड तथा नेपाल वातावरण संरक्षण केन्द्र

मुख्य सूचनादाताहरूको लागि अन्तर्वार्ता (सरकारी निकाय तथा अन्य सूचनादाताको लागि)

नाम:..... संस्था..... पद.....,
ठेगाना..... सम्पर्क नम्बर.....

१. नेपालमा याक चिज तथा छुर्पि मूल्य श्रृंखलाका मुख्य मुख्य पात्रहरू को को हुन ?
२. हाल तपाईंको कारखाना/वरपर/जिल्लामा कति चिज र छुर्पि उत्पादन भई रहेको छ ? यो उत्पादन विगत ५/१० वर्षको तुलनामा कस्तो हो ? परिमाण र बजार मुल्यको आधारमा भन्नुहोस ।
३. उत्पादन भएको चिज/छुर्पि कहाँ बेच्नुहुन्छ/बेच्ने गर्छन ?
४. तपाईंलाई जानकारी भए अनुसार कुन कुन स्थान/ मुलुकबाट कति कति माग भई आउने गर्छ ?
५. बजार विस्तार गर्न सक्ने अवस्था कस्तो छ ? कुन कुन क्षेत्रमा वढाउन सकिन्छ ?
६. बजार विस्तारको लागि देखिएका मुख्य मुख्य समस्या के के हुन ?
७. बजार विस्तारको लागि के के कुरामा ध्यान दिनुपर्छ ? कसको जिम्मेवारी के के हुनुपर्छ ?

क्र.स	निकाय	जिम्मेवारी	कैफियत
१	नेपाल सरकार		
२	प्रदेश सरकार		
३	स्थानीय तह		
४	चिज/छुर्पि उत्पादक		
५	चिज/छुर्पि भण्डार गर्ने कोल्ड स्टोर		
६	निर्यातकर्ता		
७	वितरक		
८	होल सेलर		
९	रिटेलर		
१०	दुध उत्पादक किसान		

क्र.स	निकाय	जिम्मेवारी	कैफियत
११	पशु प्रसार सेवा प्रदायक		
१२	दुध उत्पादन सामग्री प्रदायक		
१३	वित्तिय सेवा प्रदायक		
१४	विमा सेवा प्रदायक		
१५	अनुसन्धान गर्ने संस्था		

८. चिज/छुर्पिको मूल्य बजारमा कति पर्छ ?

क) होल सेल

ख) रिटेल

९. चिज र छुर्पिको दीगो बजार विस्तारको लागि के गर्नु पर्ला ?

१०. नेपालमा उत्पादन हुने चिज तथा छुर्पिको सामुहिक ब्रेडमार्क प्राप्तिको लागि के के गर्नु पर्ला ?

११. नेपालमा दुध र दुग्ध पदार्थ (खास गरी चिज र छुर्पि) उत्पादन, वस्तु विवधिरण, प्रवर्द्धन र ब्राण्डिङ्ग सम्बन्धमा कायम रहेका ऐन, कानून, नीति, नियम के के छन् ?

१२. तपाईंलाई दुध र दुग्ध पदार्थ (खास गरी चिज र छुर्पि) उत्पादन, वस्तु विवधिरण, प्रवर्द्धन र ब्राण्डिङ्ग सम्बन्धमा codex, OIE code, SPS सम्झौता, राष्ट्रिय कानूनी अवस्था र यसको कार्यान्वयन अवस्था कस्तो लाग्छ ?

१३. तपाईंको जिल्लामा कुन कुन ठाउँमा चिज र छुर्पि उत्पादन हुने गरेको छ ? तिनिहरुको नाम र ठेगाना बताई दिनुहोस ।

क्र.स	चिज उत्पादकको नाम र ठेगाना	सम्पर्क व्यक्ति र नम्बर	छुर्पि उत्पादकको नाम र ठेगाना	सम्पर्क व्यक्ति र नम्बर

१४. तपाईंलाई जानकारी भए अनुसार चीज/छुर्पि उद्योग वा घरमै उत्पादन गर्ने उत्पादकहरूले कति दुध खपत गर्दछन् र कति चीज/छुर्पि उत्पादन गर्दछन् ?

क्र.स	दुध खपत	चीज उत्पादन (के.जी)	छुर्पि उत्पादन (के.जी)
उद्योग			
घरमै उत्पादन			

१५. तपाईंलाई थाहा भए अनुसार याक चीज र छुर्पि ग्रेडिङ्ग गरि उत्पादन गर्नेहरू कति छन् जस्तो लाग्छ ?

चीज:..... छुर्पि:.....

१६. मुलुक बाहिर चीज र छुर्पि उत्पादन र बजारीकरण गर्ने कार्यमा लागेकाहरू कति होलान ? बताईदिनुहोस ।

१७. नेपालबाट विदेश तर्फ चीज र छुर्पि निर्यात गर्ने संघ, संस्था, व्यापारीहरूको नाम, ठेगाना र निर्यात गर्ने परिमाण बताईदिनुहोस ।

क्र.स	चीज निर्यात गर्ने (संघ, संस्था, व्यक्ति)	छुर्पि निर्यात गर्ने (संघ, संस्था, व्यक्ति)

१८. चीज र छुर्पि उत्पादन, भण्डारण, सीतभण्डार, गुण नियन्त्रण, बजार व्यवस्थापन, विविधिकरण र निर्यात प्रवर्द्धन (खास गरी मानव समसाधन र व्यवस्थापकीय क्षमता) विकास गर्न आवश्यक ज्ञान र सीप अभिवृद्धि गर्न के के गर्नु पर्ला ?

१९. याक चीज र छुर्पिको लागि सामुहिक ट्रेडमार्क लिई राष्ट्रिय, अन्तराष्ट्रिय बजार प्रवर्द्धन गर्न के के गर्नु पर्ला ?

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Annex: 2.5 Focus Group Discussion Guide

नेपालमा याक चिज र छुर्पिको बजार प्रवर्द्धन, ब्राण्डिङ र निर्यात सम्बन्धि अध्ययन

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राष्ट्रिय दुग्ध विकास बोर्ड तथा नेपाल वातावरण संरक्षण केन्द्र

समुह छलफलको लागि चेकलिस्ट

(दुध उत्पादक सहकारी संस्था, कृषक समुह, साना छुर्पि उत्पादकको लागि)

छलफल भएको स्थान:

मिति

समय देखि..... सम्म.....

छलफल चलाउने व्यक्ति:.....

समुह छलफलका सहभागिहरु

क्र.स	नाम र ठेगाना	संस्था	पद	सम्पर्क नं
१				
२				
३				
४				
५				
६				
७				

१. हाल तपाईंको कारखाना/वरपर/जिल्लामा कति चिज र छुर्पि उत्पादन भई रहेको छ ? यो उत्पादन विगत ५/१० वर्षको तुलनामा कस्तो हो ? परिमाण र बजार मुल्यको आधारमा भन्नुहोस ।

२. उत्पादन भएको चिज/छुर्पि कहाँ बेच्ने गर्छन ?

३. चिज/छुर्पिको मूल्य बजारमा कति पर्छ ?

क) होल सेल

ख) रिटेल

४. तपाईंको जिल्लामा कुन कुन ठाउँमा चिज र छुर्पि उत्पादन हुने गरेको छ ? तिनिहरुको नाम र ठेगाना बताई दिनुहोस ।

क्र.स	चिज उत्पादकको नाम र ठेगाना	सम्पर्क व्यक्ति र नम्बर	छुर्पि उत्पादकको नाम र ठेगाना	सम्पर्क व्यक्ति र नम्बर

५. तपाईंलाई जानकारी भए अनुसार चीज/छुर्पि उद्योग वा घरमै उत्पादन गर्ने उत्पादकहरूले कति दुध खपत गर्दछन् र कति चीज/छुर्पि उत्पादन गर्दछन् ?

क्र.स	दुध खपत	चीज उत्पादन (के.जी)	छुर्पि उत्पादन (के.जी)

६. चीज र छुर्पि उत्पादन, भण्डारण, सीतभण्डार, गुण नियन्त्रण, बजार व्यवस्थापन, विविधिकरण र निर्यात प्रवर्द्धन (खास गरी मानव समसाधन र व्यवस्थापकीय क्षमता) विकास गर्न आवश्यक ज्ञान र सीप अभिवृद्धि गर्न के के गर्नु पर्ला ?

७. याक चीज र छुर्पिको लागि सामुहिक ट्रेडमार्क लिई राष्ट्रिय, अन्तराष्ट्रिय बजार प्रवर्द्धन गर्न के के गर्नु पर्ला ?

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Annex: 2.6 Secondary Information Collection Checklist

नेपालमा याक चिज र छुर्पिको बजार प्रवर्द्धन, ब्राण्डिङ्ग र निर्यात सम्बन्धि अध्ययन

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दीतीयक सुचना संकलनको लागि फर्मेट

१. नेपालमा याक चिज तथा छुर्पि मूल्य शृंखलाका मुख्य मुख्य पात्रहरु को को हुन ?

२. नेपालमा दुध र दुग्ध पदार्थ (खास गरी चिज र छुर्पि) उत्पादन, वस्तु विवधिरण, प्रवर्द्धन र ब्राण्डिङ्ग सम्बन्धमा कायम रहेका ऐन, कानून, नीति, नियम के के छन् ?

३. खाद्य प्रविधि तथा गुण नियन्त्रण विभागबाट परीक्षण भए अनुसार चिज/छुर्पिको भौतिक र रासायनिक गुणहरु दिनुहोस ।

विवरण	याक चिजको लागी नेपाल मापण्ड	परीक्षण नतिजा	विवरण	छुर्पिको लागि नेपाल मापण्ड	परीक्षण नतिजा
Coagulating Agent	0. 02% Max				
Emulsifiers	0. 02% Max				
Stabilizers	0. 02% Max				
Edible coloriong agent	0. 02% Max				
Moisture % (Mass)	43% Max				
Milk Far % (Mass)	42% max				
Edible Salt % (NaCl)	2.5% max				

४. याक चिज र छुर्पिको विगत १० वर्ष यताको देश भित्र र अन्तराष्ट्रिय वजारको मुल्य । अव आउदो १० वर्षमा कति मुल्य होला जस्तो लाग्छ ?

वस्तु	मुल्य (रु) प्रति केजि									
	२०११/१२	२०१२/१३	२०१३/१४	२०१४/१५	२०१५/१६	२०१६/१७	२०१७/१८	२०१८/१९	२०१९/२०	२०२०/२१
याक चिज										
छुर्पि										

५. याक चिज र छुर्पिको विगत १० वर्ष यताको आयात निर्यातको अवस्था (परिमाण/मुल्य) बताईदिनुहोस । अब आउदो १० वर्षमा कति परिमाण/मुल्य होला जस्तो लाग्छ ?

वर्ष	याक चिज				छुर्पि			
	आयात		निर्यात		आयात		निर्यात	
	टन	रु	टन	रु	टन	रु	टन	रु
२०११/१२								
२०१२/१३								
२०१३/१४								
२०१४/१५								
२०१५/१६								
२०१६/१७								
२०१७/१८								
२०१८/१९								
२०१९/२०								
२०१९/२१								

६. नेपालबाट विदेश तर्फ चिज र छुर्पि निर्यात गर्ने संघ, संस्था, व्यापारीहरुको नाम, ठेगाना र निर्यात गर्ने परिमाण

क्र.स	चीज निर्यात गर्ने (संघ, संस्था, व्यक्ति)	छुर्पि निर्यात गर्ने (संघ, संस्था, व्यक्ति)

७. नेपालबाट याक चिज र छुर्पि उत्पादन गर्ने

क्र.स	चीज उत्पादन गर्ने (संघ, संस्था, व्यक्ति)	छुर्पि उत्पादन गर्ने (संघ, संस्था, व्यक्ति)

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ANNEX: 3.: THE CHEESE PRODUCTION IN THE WORLD BY COUNTRIES

SN	Country	Production (Tons)	Production per Person (Kg)
1	United States of America	5,584,857	17.039
2	Germany	2,740,582	33.122
3	France	1,886,044	28.026
4	Italy	1,253,842	20.746
5	The Netherlands	771,941	44.747
6	Poland	744,044	19.359
7	Russian Federation	664,000	4.521
8	Egypt	628,750	6.449
9	Czech Republic	568,577	53.572
10	Argentina	558,907	12.561
11	United Kingdom	410,000	6.208
12	Canada	407,260	10.944
13	Denmark	369,100	63.748
14	New Zealand	325,000	66.311
15	Australia	311,460	12.434
16	China	252,550	0.181
17	Iran	241,125	2.949
18	Spain	227,769	4.882
19	Greece	220,100	20.44
20	Austria	219,096	24.79
21	Switzerland	206,336	24.295
22	Turkey	203,933	2.524
23	Ireland	191,400	39.407
24	Belarus	175,679	18.535
25	Venezuela	172,863	5.431
26	Saudi Arabia	165,000	4.938
27	South Sudan	156,565	12.705
28	Mexico	155,698	1.248
29	Ukraine	142,523	3.372
30	Myanmar	135,751	2.52
31	Israel	132,420	14.865
32	Japan	131,852	1.042
33	Syria	115,192	6.3
34	Sudan	107,950	2.646
35	Finland	99,126	17.964
36	Ecuador	97,240	5.698

SN	Country	Production (Tons)	Production per Person (Kg)
37	Hungary	93,082	9.526
38	Sweden	90,000	8.848
39	South Africa	88,789	1.538
40	Chile	88,705	5.048
41	Romania	87,000	4.456
42	Bulgaria	83,853	11.894
43	Lithuania	82,891	29.596
44	Uruguay	80,200	22.875
45	Belgium	76,530	6.703
46	Norway	76,200	14.344
47	Portugal	73,198	7.113
48	Niger	61,202	2.851
49	Colombia	58,500	1.172
50	Azerbaijan	58,297	5.89
51	Nicaragua	50,438	8.025
52	Slovakia	48,999	9.002
53	Brazil	46,640	0.223
54	Estonia	40,500	30.702
55	Serbia	36,120	5.159
56	Latvia	35,160	18.258
57	Morocco	33,375	0.96
58	Croatia	32,619	7.781
59	Lebanon	28,590	4.692
60	Yemen	24,425	0.845
61	Afghanistan	23,166	0.734
62	Uzbekistan	22,650	0.694
63	Kazakhstan	22,586	1.236
64	Peru	22,534	0.721
65	Albania	20,850	7.264
66	Tajikistan	18,510	2.073
67	Armenia	18,320	6.169
68	Slovenia	16,972	8.211
69	Guatemala	14,606	0.844
70	Costa Rica	14,249	2.848
71	Cuba	14,200	1.265
72	Panama	14,114	3.394
73	Honduras	13,879	1.54
74	Tanzania	13,000	0.24
75	Iraq	12,327	0.313
76	Iceland	12,060	34.158
77	Bolivia	11,359	1.005
78	Nigeria	10,593	0.054

SN	Country	Production (Tons)	Production per Person (Kg)
79	Macedonia	8,000	3.855
80	Moldova	7,427	2.092
81	Cyprus	7,322	8.566
82	Jordan	7,185	0.702
83	Tunisia	7,107	0.621
84	Mauritania	6,961	1.747
85	Palestinian Territories	6,253	1.374
86	Montenegro	6,160	9.898
87	Ethiopia	6,000	0.056
88	Bosnia and Herzegovina	5,592	1.478
89	Mongolia	5,085	1.577
90	Thailand	4,680	0.068
91	Dominican Republic	4,500	0.438
92	Kyrgyzstan	3,177	0.504
93	El Salvador	2,952	0.444
94	Zimbabwe	2,475	0.167
95	Oman	2,335	0.466
96	India	2,250	0.002
97	Turkmenistan	1,900	0.325
98	Botswana	1,890	0.821
99	Algeria	1,540	0.036
100	Angola	1,289	0.044
101	Zambia	1,083	0.064
102	Bangladesh	1,000	0.006
103	Eritrea	661	0.127
104	Namibia	375	0.155
105	Kenya	320	0.006
106	Malta	169	0.355
107	Bhutan	61	0.084
108	Georgia	40	0.011
		22,651,609	

Source: [World Cheese Production by Country - AtlasBig.com](http://www.atlasbig.com),
[https://www.atlasbig.com › en-gb › countries-by-cheese...](https://www.atlasbig.com/en-gb/countries-by-cheese...)

ANNEX: 4 : LIST OF CHEESE PRODUCERS

SN	Name of Cheese industry	Address	Phone	Propiter
A	Yak Cheese			
	DDC	Lainchour, Kathmandu		
1	Duppa Sherpa	Ramechhap		

SN	Name of Cheese industry	Address	Phone	Propiter
2	Ganga Bdr Jirel	Dolkha		
B	Kanchan Cheese			
1	Lucky Dairy	Suryodaya MP-3, Teeenkutte	9842657874, 9849500991	Tulu Tamang
2	Panchamrit Dairy	Suryodaya MP-3, Bandhdhaam	98149226741, 98639168668	Chandra Bdr Rai
3	Binayak Dairy	Suryodaya MP-3, Bandhdhaam	9842601083, 9814063855	Mahendra Pradhan
4	Anmol Dairy	Suryodaya MP-3, Rusung	9842648772, 9844631822	Gobinda Khadka
5	Kusang Dairy	Suryodaya MP-10, Aahale	9866797979	Dawa Pakhrin
6	Sherpa Dairy Udhyog	Suryodaya MP-3, Maipokhari	9863683363, 9807985102	Renjo Furwa Sherpa
7	Kanchanjanga Dairy	Ilam MP-1, Rakse	9847240969, 9814040450	Aang Rita Sherpa
8	Ilameli Agriculture Research	Ilam MP-1, Shakhejung	9851063073	Sabin Sherpa
9	Pandab Dairy Udhyog	Ilam MP-1, Ghakhor	9842744073, 9842645722	Man Kumari Sunuwar
10	Mahat Dairy Udhyog	Ma. Gapa-1, Nayabazaar	9842765406, 9852680019	Toya Mahat
11	Paurakhi Dairy Udhyog	De. Ga.Pa-1, Ranke Deurali	9852680126, 9817954886	Santosh Khatri
12	Siddharth Gautam Dairy	Maipokhari Ga.pa-3	9844681039	Pasang Chiring Golbo
13	Ilameli Cheese Dairy	Suryodaya NP-2, Hile	9842695252	Wandel Sherpa
14	Sundar Dairy	Suryodaya NP-9 Sundarpani	9817910029	Prem Yolmo
15	Pauwabhanjyang Dairy Udhyog	Panchthar, Pauwa Bhanjyang	9842784745	Indra Gurung
16	Sagar Sulav Dairy Udhyog	Suryodaya MP-1, Bagin	9842627329	Dhan Bdr. Pradhan
	Laxmi Dairy Udhyog	Ilam MP-1, Shakhejung	9843961661	Dhan Singh Rai
17	Pathibhara Dairy	Maipokhari Ga.Pa.5	9842724243	Lakpa Yolmo

ANNEX: 5: THE MILK USE FOR CHEESE PRODUCTION

SN	Cheese	Annual milk used (Lits)
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SN	Cheese	Annual milk used (Lits)
A	Yak Cheese	
	DDC	
1	Gosaikunda	52338.7
2	Chordung	26962
3	Langtang	13876
4	Thodung	31518
5	Pike	15509.3
6	Chankhu	41804.5
7	Gatlang	64676.1
8	Dhunche	52924.3
9	Tatopani	42093.8
10	Thuman	0
	Total	341702.7
	Private	
1	Duppa Sherpa	14400
2	Ganga Bdr Jirel	18000
	Sub Total	32400
	Total Yak	374102.7
B	Kanchan Cheese	
	DDC	
1	Pashupatinagar	67522
2	Rakse	54232
3	Ranke	48275
4	Gopetar	15829.5
5	Nayabazar	32180
6	Maipokhari	42894
7	Charibhanjyang	19113
	Sub Total	280045.5
C	Cheese/Paneer	
	DDC	
1	Nagarkot	59229
2	Chipabhangyang	24889.64
3	Bhimpokhari Pauwa	80931
4	Bhakundebesi	40733
5	Chukhabesi	9447.5
6	Kartike Deurali	17645
	Sub Total	232875.1
D	Private dairies	
1	Lucky Dairy	792000
2	Panchamrit Dairy	324000
3	Binayak Dairy	468000

SN	Cheese	Annual milk used (Lits)
4	Anmol Dairy	324000
5	Kusang Dairy	252000
6	Sherpa Dairy Udhyog	180000
7	Kanchanjangha Dairy	180000
8	Ilameli Agriculture Research	180000
9	Pandab Dairy Udhyog	108000
10	Mahat Dairy Udhyog	540000
11	Paurakhi Dairy Udhyog	396000
12	Siddharth Gautam Dairy	108000
13	Ilameli Cheese Dairy	252000
14	Sundar Dairy	216000
15	Pauwabhanjyang Dairy Udhyog	252000
16	Sagar Sulav Dairy Udhyog	180000
	Laxmi Dairy Udhyog	180000
17	Pathibhara Dairy	126000
	Sub Total	5058000
	Total	5945023

ANNEX: 6: DISTRICT-WISE ESTIMATED MILK USED FOR CHHURPI PRODUCTION

SN	Districts	Daily milk	Annual
1	Dhankuta	5000	1800000
2	Terhathun	5500	1980000
3	Ilam	7500	2700000
4	Sankhuwasabha	800	144000
5	Solukhumbu	1000	180000
6	Pantchthar	5000	1800000
7	Taplejung	4000	720000
8	Jhapa	4500	1620000
9	Sunsari	2500	900000
	Province 1 Total	35800	11844000
10	Sindhuli	2500	900000
11	Makwanpur	5000	1800000
13	Chitwan	2000	720000
14	Kabre	3200	1152000
15	Dolkha	1000	360000

SN	Districts	Daily milk	Annual
16	Ramechhap	3000	1080000
19	Rasuwa	1500	270000
20	Nuwakot	1000	360000
21	KTM	2800	1008000
22	Lalitpur	2500	900000
23	Bhaktapur	1500	540000
	Total Bagmati Pradesh	26000	9090000
17	Baglung	1000	360000
	Total Gandaki Pradesh	1000	360000
18	Palpa	3000	1080000
12	Kapilbastu	2500	900000
	Total Lumbini Pradesh	5500	1980000
24	Kailali	2700	972000
25	Kanchanpur	2700	972000
	Total Sudur Paschim Pradesh	5400	1944000
	Total	73700	25218000