別添資料 T3-5 酪農適正技術テキスト（普及チーム用）英語版

The Project on Sustainable Livestock Development for Rural SINDH "PSLD"
(JICA Technical Cooperation)

Textbook for Appropriate Technology of Dairy Farming for Extension Team

PSLD

January 2019

AP2-275

January 2019

Produced by The Project on Sustainable Livestock Development for Rural Sindh (PSLD)

Sponsored by Japan International Cooperation Agency (JICA)

Preface

Livestock is the largest sub-sector in agriculture of Pakistan, contributing 11.4 percent to overall GDP of the country. Livestock plays vital role in rural economy and livelihood of rural poor, so as in rural Sindh. It is a source of cash income, nutrition and sometimes only asset for the rural and marginalized people.

The Project on Sustainable Livestock Development for Rural Sindh (The Project) is the 5 year technical cooperation project implemented in collaboration with the Livestock and Fisheries Department, Government of Sindh and Japan International Cooperation Agency (JICA), Government of Japan, aiming for creating foundations of sustainable livestock sector development in Sindh province, which benefit small scale dairy farmers who comprises more than 80 percent of the sector. The Project was initiated in February 2014 and implemented in 5 pilot districts, namely Matiari, Hyderabad, Tando Muhammad Khan, Tando Allahyar and Badin. The Project focused on development of appropriate technologies for dairy farming. Throughout five years of implementation, appropriate technologies were developed, piloted and verified for the use of small scale formers in Sindh province. Along with the appropriate technologies, useful basic technologies for livestock professional technicians were developed. The technologies range over 8 areas, namely, farm management, marketing, feeding management, fodder, animal health, animal reproduction and genetic improvement, Livestock assets. The Project worked on effective utilization of livestock resources, i.e. calves and dry buffaloes in the commercial cattle colony as well. Method for salvation of calves and dry buffaloes were verified.

Technologies developed by the Project are compiled as textbooks, guidelines and booklets for wider application and dissemination to professional technicians, and ultimately to farmers. The Livestock and Fishery Department hope that these series of publications will widely be used by livestock professional technicians both public and private and dairy farmers in Sindh province for uplifting their livelihood.

Director General / Project Coordinator
The Livestock and Fisheries Department
Government of Sindh

Foreword

The Project on Sustainable Livestock Development for Rural Sindh has been implemented in Southern parts of Sindh Province, Pakistan in collaboration with Livestock and Fisheries Department, Government of Sindh and Japan International Cooperation Agency (JICA). The Project was supported by the team of Japanese experts headed by Mr. Hiroshi Okabe.

The long-term objectives of the Project are improvement of productivity of milk and increase of income of small scale dairy farmers. The number of cattle/buffalo reared by one small scale dairy farm is small, generally within 5 heads, which includes both adult cattle/buffalo, heifers and calves. Most of small scale dairy farmers do not possess their own land. Under such conditions it is difficult to run sound dairy farming. Towards the long-term objectives, 50 appropriate technologies have been verified by the Project. The technologies are ranked A, B and C. The number of each technology is 20, 22 and 8, respectively.

The definition of each rank is as follows:

Rank A: Technology ranked as 'A' is defined as highly effective and easy to apply at farms.
Rank B: Technology ranked as 'B' is defined as highly effective but not easy to apply at farms.
Rank C: Technology ranked as 'C' is defined as middle level effective and not easy to give guidance and apply at farms during the project period.

Livestock technicians are expected to provide technical guidance on rank A technologies to farmers as an initial step. Rank B and C technologies are also essential for sound dairy farming management. Livestock technicians therefore are encouraged to continue technical guidance on those technologies.
Besides, 32 useful technologies which are effective for increasing milk production in the long term have been identified by the Project. The useful technologies include reproductive disorder diagnosis and treatment, milk test and pedigree registration for genetic improvement, animal sheds and so on.
In this textbook, 50 appropriate technologies and 9 useful technologies are explained.

The Project activities have been carried out by 9 Pakistani Veterinary Officers of Sindh Livestock and Fisheries Department as the counterparts of the Project along with 13 Japanese experts and a Bolivian expert on Andrology. This textbook was compiled based on these Project activities. Logistic support from the project national staff were indispensable for compilation of the textbook as well.
We would like to take this opportunity to thank all those involved in development of this textbook. We hope this textbook is useful for technicians who shall give technical guidance to small scale dairy farmers in Sindh province.

Editor in Charge Dr. Hideo Tominaga
Along with Support of the Technical Counterparts of Sindh Livestock and Fisheries Department
and the Japanese Expert Team

Pakistani Counterparts

Dr. Ghullam Muhammad Jiskani, Specialist in Farm management
Dr. Safdar Ali Fazlani, Specialist in Feeding Management
Dr. Muhammad Arif Khan, Specialist in Fodder
Dr. Akthar Ali Shahani, Specialist in Animal Reproduction
Dr. Zulfiqar Ali Pathan, Specialist in Animal Health
Dr. Muhammad Mubarak Jatoi, Specialist in Genetic Improvement
Dr. Iqtadar Ali Memon, Specialist in Marketing
Dr. Naeem Siddique Ansari, Specialist in Animal Assets
Dr. Rukhsana Vighio, Specialist in in Training

Pakistani National Staff

Dr. Ghulam Sarwar Shaikh, General Coordinator
Dr. Rasool Bux Soomro, Technical Coordinator
Ms. Zahida Soomro, Technical Assistant

Japanese experts

Dr. Hideo Tominaga, Expert on Livestock Technology Development
Dr. Teruo Sugiwaka, Expert on Feeding Management
Mr. Teruo Kawamura, Expert on Feeding Management
Dr. Shinsuke Kobayashi, Expert on Fodder
Dr. Kazuhiro Ono, Expert on Animal Reproduction
Dr. Takeshi Abe, Expert on Animal Reproduction
Dr. Shigehisa Tsumagari, Expert on Animal Reproduction
Dr. Yoshitaka Nagamine, Expert on Genetic Improvement
Mr. Yoshio Chiba, Expert on Genetic Improvement
Ms. Fumiko Ikegaya, Expert on Marketing
Dr. Yukio Ikeda, Expert on Farm Management
Mr. Naofumi Tsukidate, Expert on Hoof Cutting
Ms. Noriko Hara, Expert on Livestock Technology Development
Ms. Mika Kawamoto, Expert on Livestock Extension/Gender

Bolivian Expert (3rd county Expert)

Dr. Jose Nazario Videz, Expert on Andrology

Extension Team of the Project

Dr. Anisa Soomro, Extension Team Leader, Gender Specialist
Dr. Farzana Sarki, Social Mobilizer
Dr. Kabeer Ali Kalhoro, Master Trainer Badin
Dr. Muhammad Mubeen Soomro, Master Trainer Hyderabad
Dr. Farooque Ahmed Pathan, Master Trainer Matiari
Dr. Iqbal Ahmed Memon, Master Trainer Tando Muhammad Khan
Dr. Uzma Abbas Chattah, Extension Worker, Badin
Dr. Bibi Ghulam Zuhra Shah, Extension Worker Hyderabad
Dr. Raheela Parveen, Extension Worker Hyderabad
Dr. Reema Tunio, Extension Worker Matiari
Dr. Musarat Kumbhar, Extension Worker Matiari
Dr. Sonia Mirza, Extension Worker Tando Allahyar
Dr. Irum Laghari, Extension Worker Tando Allahyar
Dr. Sheeren Memon, Extension Worker Tando Muhammad Khan
Mr. Muhammad Sharif, Extension Worker Badin
Mr. Zahid Ali Boohar, Extension Worker Badin
Mr. Arif Ali Junejo, Extension Worker Hyderabad
Mr. Ahsan Khan, Extension Worker Hyderabad
Mr. Ashfaque Ali Kaka, Extension Worker Matiari
Mr. Abdul Manan Rahu, Extension Worker Matiari
Mr. Abdul Ghani, Extension Worker Tando Allahyar
Mr. Barkat Ali Shaikh, Extension Worker Tando Muhammad Khan
Mr. Meva Ram, Extension Worker Tando Muhammad Khan

List of Appropriate technology

Technical field	No		Appropriate technology	Rank
1. Farm Management	1	1	Sound dairy farm management	C
	2	2	Reduce Labor Cost	B
	3	3	Reduce Expenditure of Dairy Farm	C
2. Marketing	1	4	Deliver sizable milk regularly	C
	2	5	Trial to Introduced the milk company to some of P/F	C
	3	6	Do not adulterate milk with water	A
3. Feeding Management	1	7	To supply sufficient water	A
	2	8	Clean water	A
	3	9	Improving Tie Method	A
	4	10	Shade	B
	5	11	Good Ventilation	A
	6	12	Keeping dry floor	A
	7	13	Right calf management after its birth	A
	8	14	Right milking colostrum	A
	9	15	Health management of suckling calf	B
	10	16	Prevention measurement against heat for calf	A
	11	17	Improvement of roof and floor at place milking	B
	12	18	Management cow at time of parturition	A
	13	19	Appropriate feeding cow after parturition	B
	14	20	Management dry cow	B
	15	21	Appropriate feeding cow before parturition	B
	16	22	Bathing	A
	17	23	Shower	A
	18	24	Hoof- cutting	A
	19	25	BCS for milking animal	A
	20	26	Degree of nutrition for calves	A
	21	27	Using Retainer	C
	22	28	Drinking sufficient water（Freedom drinking water)	B
	23	29	Correct Milking Techniques	B
	24	30	Co Management of Livestock	C
4. Fodder	1	31	Trail Formula Feed Plan	C
	2	32	Feed a good quality roughage	B
	3	33	Clean up trough of Feed	A
	4	34	Making hay for calve	A
	5	35	Concentrate for calves	B
5. Reproduction	1	36	Recording of reproduction	B

Technical field	No		Appropriate technology	Rank
	2	37	Detection heat	A
	3	38	Diagnostic of reproduction	B
6. Animal Health	1	39	Management diarrhea for calf	B
	2	40	Prevention FMD	B
	3	41	Prevention HS	B
	4	42	De-worming & Cleaning strictly shed /paddock	B
	5	43	De-worming of appropriate age of calves	B
	6	44	Rotation of chemicals with different component	B
	7	45	Prevention of Ecto Parasite	B
	8	46	Blood parasite	B
	9	47	Prevention & treatment of Mastitis	C
7. Genetic Improvement	1	48	Try to identify good buffalo bull	A
	2	49	Awareness of Genetic Improvement	A
	3	50	Using guaranty bull	B

List of Basic Technology

Full-scale trial：○Semi-trial：△Not implemented：X

Technical field	No		Basic technology	Degree of Application during the project period
1. Farm Management	1	1	Classification dairy farmers	○
	2	2	Analysis Dairy Economy	○
	3	3	Recording on farm management information	○
2. Marketing	1	4	Collection the marketing information of milk and livestock animal	△
3. Feeding Management	1	5	To improve quality water	X
	2	6	Grazing	X
	3	7	Milking Shed	○
	4	8	Simple Shed	○
	5	9	Paddock	○
	6	10	Cold Counter Measure	△
	7	11	Feeding Trough	○
	8	12	Water Trough	○
4. Fodder	1	13	Cutting Roughages	△
	2	14	Roughages production	○

Technical field	No		Basic technology	Degree of Application during the project period
	3	15	Analysis of Feed	○
	4	16	Analysis of soil	△
	5	17	Provide salt to Cattle/Buffalo	△
5. Reproduction	1	18	Abortion	△
	2	19	Retention of Placenta	X
	3	20	Prolapse	X
	4	21	Reproductive disorder	○
	5	22	Andrology	○
	6	23	Physiological survey for buffalo	○
	7	24	Artificial Insemination	X
6. Animal Health	1	25	Hygienic treatment technology	○
	2	26	Brucellosis	○
	3	27	Tuberculosis	○
7. Genetic Improvement	1	28	Milk test	○
	2	29	Pedigree registration	○
8. Livestock Assets	1	30	Guideline of Monitoring calves system	○
	2	31	Guideline of Calves distribution system	○
	3	32	Guideline of Recycling of dry buffalo system	○

(Remarks)

The unit, kilo gram (KG) is used for milk yield in this textbook.

The weight of 1,000 ml (1 liter) of milk at a temperature of 15 ° C is calculated as 1,030 g (1.3 kg).

Calculating formula:

1,000ml x 1.03 (specific gravity of milk) = 1,030g

This textbook is using unit of milk production in kilogram except field of marketing.

Contents

Chapter 1 Basics for improving dairy farm management

Let's increase the milk production through improving your dairy farm management techniques so that your living standard can be improved.

It is not easy task but can be realized and improved through farmer's efforts.

1.1 Trial for increasing milk production

In first step, try to understand what kind of technologies and how they are related to increase milk production, milk production is related with many factors.

The increase of milk production can be achieved by improvement of multiple technologies.

Objectives of the Project:

Increase of milk production

Increase of milk production will be achieved only through collaborative efforts by all fields. As the figure shows below, feeding management, fodder development, animal health, animal reproduction, and capacity of animal (genetics) must be improved comprehensively. The fields which can be improved comparatively in short time of period are feeding management, fodder development, and animal health, whereas it takes 4 to 5 years for animal reproduction and genetic improvement to achieve outcomes. Increasing number of animals by utilizing livestock resources such as calves salvation and dry buffalo recycling will also contribute for increase of milk production. it will also requires long periods of time to see any outcome of the intervention.

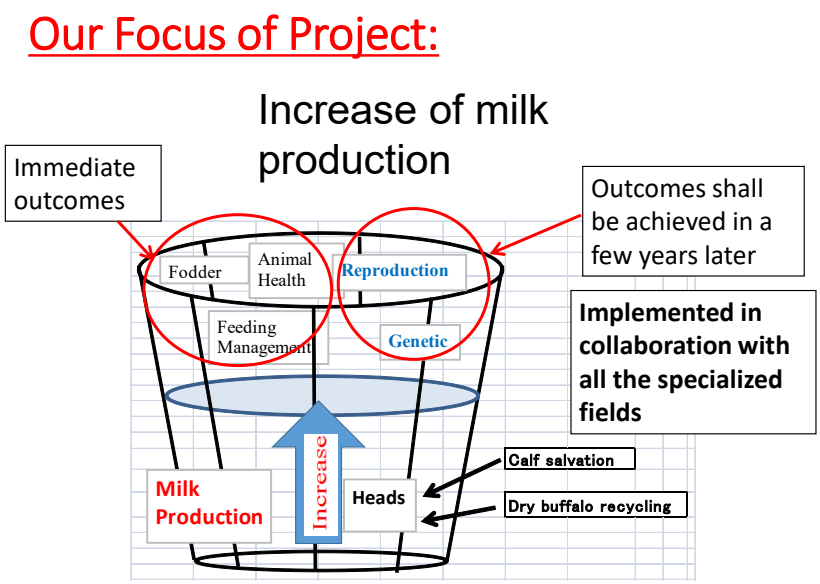


Figure 1-1 Increase of milk production by collective efforts of all fields

Chapter 2 Sound dairy farm management

2.1 Principles of sound dairy farm management

Let's try for stable dairy farm management.

Stable farm management is not easy task to achieve but try to improve your farm management step by step.

Sound dairy farm management is comprised on following steps and factors.

1) Increase of production
2) Maintaining production yield
3) Lowest possible cost of inputs

Sound farm management can be materialized through management of above steps and factors in a stable manner.

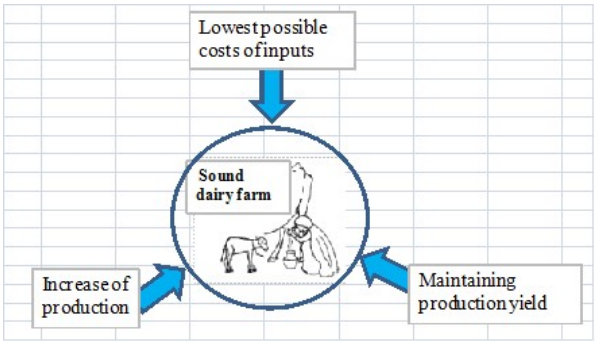


Figure 2-1 Conceptual diagram of sound dairy farm management

2.2 Points to be checked prior to start improving dairy farming

Understand your current dairy farming situation in the first place.

1) List up your available assets to understand how much assets you have.
2) Know production capacity of your milking cow and buffaloes.
3) Fix appropriate number of cattle / buffaloes reared at your farm as well as target milk production of your farm.

2.2.1 Assets of dairy farm

Assets are, land, livestock, facilities and available equipment.

List up all those assets and make their effective use.

Equipment means such as chopper, cattle/ donkey cart for carriage of fodder / water and iron sickle which requires sufficient investment.

Photo 2-1 Livestock

Photo 2-2Facilities: Milking shed

Photo 2-3 Facilities: Paddock

	
Photo 2-4 Equipment: Chopper	Photo 2-5 Equipment: Carriage of cattle

2.2.2 Land (Assets)

Check availability of land for fodder cultivation.

a. In case that land is available;

Check if you own land or not, if you have tenant land or not, any other accessible land. Following points need to be checked.

* Total area of land and area used for cultivation of fodder.

* Varieties of fodder cultivated and cultivated area.

b. In case that land is not available;

*Pattern of fodder provision in a year such as quantity and period of green fodder, grazing pattern and period (including possibility).

*For tenant farmers; utilization of natural grass in their tenant lands and possibility of grazing cattle after harvesting of crops in their tenant land.

* Kinds of roughage and quantity purchased from outside

2.2.3 Livestock (Assets)

Improvement of milk production capacity of your herd

To improve milk production capacity of your herd, high capacity cows/buffaloes need to be remained and low capacity cows/buffaloes to be eliminated. Low capacity cows/buffaloes should be replaced with high capacity ones. To further improve the capacity of replaced cows/buffaloes, high capacity bull should be used for breeding to produce good capacity offspring.

You must learn how to identify high capacity cows/buffaloes as well as bulls in the first phase.

Let's learn how to identify high capacity cows/buffaloes and bulls.

1) How to identify cows/buffaloes with high milk production capacity

In any case Cow/buffaloes must be healthy. Let's learn how to know about genetic characteristics of those high capacity cows/buffaloes. Having enough volume of udder is one of the most important feature of potential cow/buffalo. If udder is hard, it means that cow/buffalo does not produce good quantity of milk in spite of having good volume of udder. Good udder is one that has elasticity. In case of good elastic udder, tightness will be reduced after milking. Based on the statistics record, cows/buffaloes having thick milk vein and well-developed udder produce good milk yield.

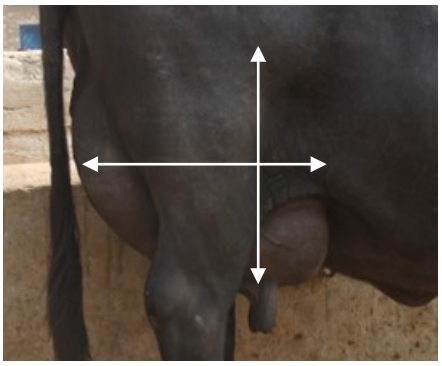
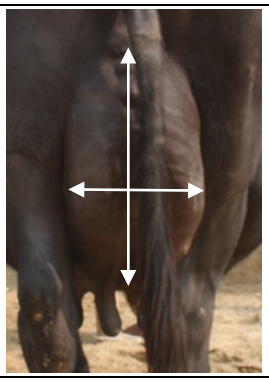
	

Photo2-6 Good volume udder (side view)	Photo 2-7 Good volume udder (rear view)	Photo 2-8 Thick and well-developed milk vein

* Points to be considered at the time of purchasing cows/buffaloes.

In addition to check udder characteristics which are mentioned above, further ask from the owner / a trader about milk production yield of those dam or sister cow. Check reproductive condition of a cow well at the time of purchase. Ask skilled veterinary doctor to perform the pregnancy diagnosis of those cows/buffaloes before purchasing for check if they are pregnant or not. In case a cow is not pregnant, check duration after last parturition. .

2) How to identify good capacity bulls

In case of bulls for beef cattle, capacity of bull can be judged from state of flesh and daily weight gain during growing period. Whereas capacity of bull for dairy cow/buffalo cannot be judged from daily weight gain and outer appearance. Instead, progeny test is conducted for identifying good capacity bull which can ensure good milk production offspring. Progeny test examines the milk production capacity of the daughter of that bull.

The bull selected through progeny test is called ‘proven bull’. Use frozen semen of ‘proven bull’ when you opt for artificial insemination.

In most cases, small scale farmers in the project area do not have own breeding bull. Bull of land owners or neighbors are used for breeding and cannot choose a bull as per farmer’s preference.

Artificial insemination for buffaloes are yet not well developed and established in Sindh province. It is ideal that farmers can choose frozen semen of good capacity ‘proven bull’ from bull buffalo catalog and using artificial insemination, which however, takes much time to happen.

Let’s check your breeding bull as much as possible as per following procedure.

a) Check milk production capacity through interview

i) Milk production of dam and sister cow/buffalo.

ii) Milk production of daughter cow/buffalo, if any

b) Check reproduction capacity

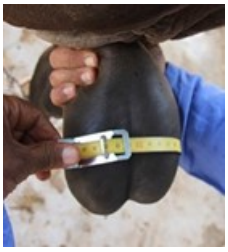
i) Having desire for mounting (Libido)

ii) Having strong legs (easy for mounting)

iii) Having healthy eyes

iv) Having enough size of testis and equally on both side

[Good bull]

			
Photo 2-9 Testicle equal on both side (Symmetrical)	Photo 2-10 Testicle equal on both side(Symmetrical)	Photo 2-11 Scrotum circumference	Photo 2-12 Strong legs

[Bad bull]

			
Photo 2-13 Testicle is not equal (Asymmetrical)	Photo 2-14 Teared scrotum, Right scrotum was not fully developed.	Photo 2-15 Twisted testicles, left scrotum is inside.	Photo 2-16 Abnormal front leg

2.3 Marketing

2.3.1 Purpose of Livestock Marketing

- The purposes of livestock marketing are to increase farmers' income and improve farmers' livelihood by understanding markets and producing/selling the livestock products which fulfill the market needs with better prices and conditions.
- It is aimed that farmers who don't have knowledge that how and how much their livestock products were sold and are enabled to recognize the market, understand necessary producing techniques and marketing channel as resulting to maximize farmers' benefit/income from their livestock products.

> For the purpose, it is important for farmers to have a mind of "produce to consume/sale" instead of "produce then consume/sell"

2.3.2 Basics of Livestock Marketing

Firstly, Veterinary Officers (V/Os) and Stock Assistants (S/As) themselves need to understand basics of livestock marketing. The basics of livestock marketing can be studied as referring the Appropriate Technology Guideline "Guideline for Basics of Marketing and Livestock Marketing".

2.3.3 Marketing of Milk

(1) To understand the market

1) V/Os and S/As needs to understand the market

V/Os and S/As needs to know the market information such as milk purchasing / selling price at tea shops / milk shops at the nearest village / town/ city from their target villages. The below table has been used as a monthly data collection by the JICA project named "The Project on Sustainable Livestock Development for Rural Sindh". The market information at major towns should be confirmed by V/Os and S/As themselves before they start extension activities for marketing.

Table 2-5 The market information collected through the monthly data collection

Shop name (location)	Milk purchasing volume	Milk purchasing price	Major purchasing channel	Sales volume	Selling price	Possibility to buy milk
xxx dairy shop (Kali Mori, Hyderabad) 0315-xxxx-xxx	80L	Rs.67.5/L	M/M from xx village	Milk: 40L Yogurt: 25L	Milk: Rs.80/L Yogurt: Rs.100/kg	Possible if quality is good

2) Let farmer understand the market

Although a few farmers understand the market information indicated in the above table, majority of farmers don't know it. Therefore, it is important to support farmers to let themselves understand the current market situation, identify marketing possibility, and start to take an action. For the purpose, let's implement the marketing workshop for farmers. The basic procedure of the marketing workshop is summarized as the Appropriate Technology Guideline "Guideline for How to Conduct Marketing Workshop for Milk and Bi-products".

V/Os and S/As discuss with farmers how farmers can improve their milk marketing channels by implementing the marketing workshop as referred in the guideline and sharing marketing success stories of P/F and others. The success stories of marketing are summarized as the Appropriate Technology Guideline "Guideline for Case Study and Potential Marketing Model".

(2) To produce milk according to needs of market

Finding better milk purchasers such as middlemen, shops, nearby households and dairy companies for better price is not the only way for marketing. For finding better purchasers, farmers have to take few steps. Farmers have two following challenges which can be overcome by themselves.

1) To produce good quality milk
 * "Good quality milk" includes a) no adulteration and b) hygienic milk with high fat %

2) To produce and deliver sizable quantity of milk
 * It can be realized by not working individually but joint group collection and delivery with farmers' neighbors or villagers

Milk buyers are usually looking for those conditions mentioned above 1) and 2).

If you can produce milk matches with 1) and 2), buyers will definitely approach farmers and farmers can sell their milk with higher price to buyers.

* Start thinking this option
* "Think" what you have to do to fulfill the above conditions

1) To produce good quality milk

a) No adulteration

Suppose you are consumers of milk.
Which milk you prefer to drink, i.e. either pure milk or adulterated milk with water?
Let's try to produce good quality milk you and your villager can be proud of it!
If you do not adulterate milk, trust of consumer / buyer will be increased. At the end you will get good milk price.

b) Hygienic milk

For hygienic milk production, milking shed facilities needs to be prepared so that milk will not

contaminated with rain and dust. For the purpose, a) set up of roof and b) improvement of floor are required.

i) Roof

Any material can be used for roof making but it is preferable to use material which makes a place cool down in summer and warm up in winter. Specifically, thatched roof, reed stalk roof, and roof with slate can be used. Roof should be higher as much as possible for better ventilation. The length of post behind of the roof should be 2.5 meter, and the front post should be 3 meters for better ventilation. The roof need to be designed that, sunshine could reach under the roof at least once a day to dry the floor.

		
Photo 2-17 Thatched roof	Photo 2-18 Reed stalk roof	Photo 2-19 Roof with Slate

ii) Floor

Any material is fine for floor, for example bricks, block and concreate slab can be used. In some cases, mud also can be used. Mud needs to be pounded and harden to make the floor higher than the ground. Front side of the floor needs to be fixed to higher elevation from the ground for better drainage. Floor should be cleaned every time before milking, during and after milking to avoid dust coming into milk.

		
Photo 2-20 Bricks	Photo 2-21 Concrete	Photo 2-22 Block

(Concrete slabs for floor making of the milking shed)

The Project developed concrete slabs for flooring of the milking shed (Photo2-23). Concrete slabs can be purchased at shops in pilot districts which shown in the Table2-6. Concrete slabs have ditches to prevent animals from slipping. The price is 350 Rs. per piece as of April 2018. Twenty inches width, 40 inches length, 2 inches thickness, concrete slabs has built-in reinforcing with strong iron steel rod. A farmer can purchase them according to their need whenever s/he can afford to purchase and lay them gradually on floor of animal shed, paddock and place for bathing. Prior to lay concrete slabs, compact a land with tools shown in the Photo2-24. Make slight slope on floor to drain water.

Photo 2-23 Concrete slabs developed by the Project

Photo 2-24 Tools for floor preparation

Table 2-6 List of shop for concrete slab in Project Pilot Districts.

District	Name of Shop	Address	Contact Number
Matiari	Shaikh Iron Store, Shop	Benazir Choke, New Saeedabad, Matiari	0300-8378841
Hyderabad	Pehlwan tile,pipe works	Opposite Bhatti Road, Near Ghanghra Mori, Mirpur Khas Road, Hyderabad	0345-3591642
Tando Muhammad Khan	Talpur Iron Shop	Near Gaja Bridge	0313-4345446
Tando Allahyar	XXXX	XXXX	XXXX
Badin	XXXX	XXXX	XXXX

(Example for improvement of floor at pilot farm)

As shown in Photo 2-25, the floor of the paddock was made up of soil in front of the animal shed. Soil was soft and mixed with dung, which makes difficulty in cleaning of floor. After placing the concrete slabs as shown in Photo 2-26, cleaning of the floor became easy, so the floor remains dry and clean all the time.

Photo 2-25 Floor before improvement

Photo 2-26 Floor after improvement

iii) Protection against strong wind

Confirm major wind direction of storms in a whole year and build a removable wall to the windward of those storms. Common local materials such as waterside weeds, other wild grass and sugarcane top can be used as materials for the wall. In addition, vinyl sheets can also be used if necessary.

		
Photo 2-27 Twig	Photo 2-28 Sugarcane top	Photo 2-29 Reed

2) To produce and deliver sizable quantity of milk

If it is difficult to produce and deliver sizable quantity of milk for an individual farmer, it can be realized by joint group collection and delivery with farmers' neighbors or villagers. Let farmers think any possibility if there is any farmers group such as relatives and/or neighbors which may enable collectively sell their milk.

Chapter 3 Feed and Feeding Management of cattle/buffalo

Let's learn basic knowledge about full capacity of cattle/buffalo and produce expected milk quantity.
First, learn about fodder, and second, learn about proper feeding management for cattle/buffaloes before, during and after parturition.

3.1 Kinds and use of fodder

3.1.1 Roughages

Cattle/Buffalo is originally herbivores. Roughage is an essential feed for keeping healthy Cattle/Buffalo. Roughage has a lot of fibers and its nutritional value is relatively low, but it is important to activate and normalize rumen function.

a. Rice straw and wheat straw (Dry Fodder)
   It is low water content and low in nutrient.
b. Green grass (Green Fodder)
   It is high water content and relatively has many nutrients.
c. Mixed feed of dry fodder and green fodder
   This feeding method is very common in Pakistan. It is good method that to mix green fodder, which is containing much water and comparatively high in nutrients, and straw which is containing less water and low in nutrients.

Photo of roughage

Photo 3-1 Rice straw: low water content and low in nutrients

Photo 3-2 Wheat straw: low water content and low in nutrients

Photo 3-3Green grass: High water content and relatively many nutrients

Photo 3-4Mixed feed of green fodder and wheat / rice straw

Elephant grass, sometimes called as Mott grass, can be grown from cuttings. Elephant grass grows quickly and has high adaptability to environment; therefore, it is easy to grow and manage. Farmers who have own irrigated lands can grow elephant grass in an irrigated field. Landless farmers can grow it in the footpath between fields, empty lot, and empty land near their houses and so on. It stops growing in the cold weather season whereas it grows faster when temperature increases. Plant elephant grass with enough quantity of manure. Give supplementary manure once in 2 years. Plenty of green leaves and protein can be obtained when it is cut under the 130 cm plant height. It will grow up to 2.5 to 3 meters height. Stem of such high height plant become hard and nutritious value is less. Farmers have to be careful about the height of elephant grass for better utilization for animal fodder.

Photo 3-5 Ideal height of grass

Photo 3-6 Planting of cutting stem

Photo 3-7 Overgrown stem, low nutritive value

3.1.2 Concentrate and Formula Feed

Concentrate is feed to produce more milk. It has low water content and rich in nutrients. This feed is very important for dairy animals.

There are many kinds of concentrate and it has different nutrient value for each kind. Common concentrates in Pakistan are cotton seed cake, wheat bran, rice bran and sunflower cake, etc. A lot of farmers in Sindh province are traditionally using one kind of concentrate or mixed concentrate. Formula feed consists of some kinds of concentrate, salt and mineral to fill the target nutrient value. The main formula feed has milking, fattening, growing and calf rearing etc..

Photo of concentrate

	
Photo 3-8 Concentrate is necessary for milk production.	Photo 3-9 There are many kinds of concentrate.

	
Photo 3-10 Formula feed making	Photo 3-11 Example of formula feed

3.1.3 Example of the feeding to maximize milk production

Necessary amount of feed should be given to milking animals to increase milk production by combination of roughage and concentrate.

Roughage should be given to buffaloes to maintain their body according to the body weight. Concentrate or formula feed should be given to buffaloes to produce milk according to milk volume.

(1) Feeding of roughage

Basically, roughages are provide to satisfy the hunger of animal.

<Way of thinking and calculation of feeding amount>

To prepare proper amount of roughage, it is necessary to know a rough estimate of required amount of roughages to be fed.

Roughage (dry matter) equal to minimum 1% of body weight need to be fed to milking animals. For instance, 4kg weight of roughage (dry matter) needs to be fed to 400 kg body weight animal. Percentage of dry matter varies in roughage types. Simple calculation is required to calculate required quantity of roughage.

The Project developed reference table for estimation of body weight for Breed of Kundhi and Kundhi cross. Body weight can be estimated from heart girth of animals. Farmers can easily estimate body weight of buffalo by measuring heart girth with reference to the table in the page 73.

Roughage can be weighted with simple spring balance. Please try it.

Photo 3-12 Measuring roughage with spring balance

(2) Exercise:

1) Ingredient table of fodder

According to the ingredient table of fodder, percentage of dry matter of natural grass and wheat straw are 10 % and 90% respectively.

Table 3-1Ingredient table of fodder

Name of roughage	Dry Matter (%)
Natural grass	20%
Wheat straw	90%
Sugar cane top	30%

2) Body weight of targeted milking buffalo

Measure a heart girth of targeted milking buffalo. In case heart girth is 179 cm, body weight is estimated as 403 kg according to reference table. Suppose body weight is 400 kg.

3) Required quantity of intake fodder for milking buffalo

Required dry matter intake quantity is calculated as 1% of body weight.

1% of 400kg body weight is 4 kg. For a 400 kg body weight buffalo, 4 kg dry matter needs to be fed.

4) Calculation of intake quantity of natural grass

Dry matter % of natural grass is 20% according to fodder ingredient table.

4 kg (required intake of dry matter) = X kg (required natural grass) * 20% (0.2)

X kg = 4 kg ÷ 20% (0.2)

X = 20 kg

5) Calculation of intake quantity of wheat straw

Dry matter % of wheat straw is 90% according to fodder ingredient table.

4 kg (required intake of dry matter) = X kg (required wheat straw) * 90% (0.9)

X kg = 4 kg ÷ 90% (0.9)

X = 4.4 kg

6) Calculation of intake quantity of sugar cane top

Dry matter % of sugar cane top is 30% according to fodder standard table.

4 kg (required intake of dry matter) = X kg (required sugar cane top) * 30% (0.3)

X kg = 4 kg ÷ 30% (0.3)

X = 13 kg

Table 3-2 Standard quantity of roughage feeding to a 400 kg body weight milking buffalo

Roughage	Amount of feeding
Natural grass	20 Kg
Sugar cane top	13 Kg
Wheat straw + natural grass	2.2 Kg+ 10Kg =12.2 Kg
Wheat straw only	4.4 Kg

Above mentioned amount of roughages are minimum necessary feed intake amount for buffaloes/cows.

(3) Formula feed for milking animals

1) Formula feed for milking buffaloes/cows developed by the Project

The Project designed formula feed with local available concentrates. The model 1 and 2 developed by the Project are shown in the Table 10. Model 1 contains cotton seed cake. Later, the Project found that imported soybean cake was available in the local market in Hyderabad with compratively reasonable price. In Model 2, therefore, good quality soybean cake are used instead of cotton seed cake.Cotton seed cake causes aflatoxin toxicity. By replacing with soybean, aflatoxin toxin affects can be avoided. Adding essential vitamins,salt minerals in formula feed is nutritious and balanced feed for milking buffaloes.

Table 3-3 Formula feed designed and produced by the Project

	Model 1	Model 2
Name of Feed	Mixed proportion %	Mixed proportion %
Maize crush	10	25
Wheat (Crush)	5	20
Cotton Seed cake	13	0
Rice polish	6	0
Wheat Bran	35	30
Sunflower Seed	30	17
Soybean	0	7
dcp(Bone meal)	1	1
Total	100	100
TDN:	67.0	74.9
CP:	18.0	18.4

1) Standard feeding of fomula feed for milking buffaloes/cows

Basically formula feed for milking buffaloes/cows should be provided accordingly to milk production volume.

In case of high capacity milking cows in Japan and other developed countries, 1kg of formula feed is given to a milking cow per 3kg of milk production volume. However, in case of Pakistan, 1kg of formula feed should be given to a buffaloe/ Zebu cow per 2kg of milk production volume. Therefore, 5kg of formula feed should be given to a buffaloe/Zebu cow per 10kg of milk production volume.

3) The effect of formula feed, -Milk volume was doubled at pilot farms-

The Project is working in 5 pilot districts, namely, Matiari, Hyderabad, Tando Allahyar, Tando Mohammad Khan and Badin. Twenty-five small scale and medium scale pilot farms (P/F) were selected from above cited districts for verification of appropriate technologies developed by the Project.

The survey conducted before the Project's intervention and found that 92% of P/F either are using or had ever used concentrate available in a local market. However, all P/F had never used formula feed. Formula feed is well-balanced mixture of concentrates whose nutrients value is guaranteed.

The Project developed formula feed whose crude protein (CP) was more than 18%, Total digestible nutrients (TDN) was more than 72% with essential minerals. The Project conducted feeding trial of formula feed to maximum 2 heads of buffaloes at each P/F for 2 years and 8 months.

The results of the trial were shown in Table 3-4.

Table 3-4 Results of formula feed trial

	Average milk production per lactation (305 days)	Average milk production per day
Buffalo fed with formula feed (45 heads)	2,672 kg	8.8 kg
Buffalo without formula feed (18 heads)	1,443 kg	4.7 kg

Photo 3-13 Milking buffalo by farmer with smiling face.

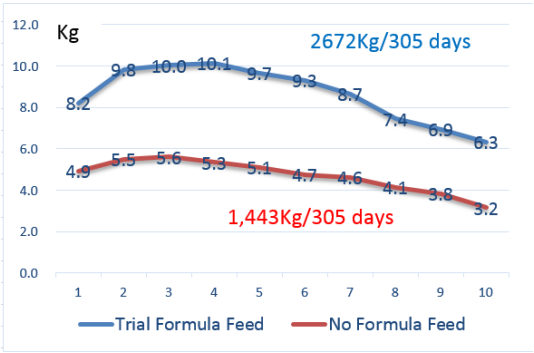


Figure 3-1 Blue line indicates the buffalo fed with formula feed and milk production becomes double, whereas the red line indicates low milk production without formula feed).

3.2 Feeding management before, during and after parturition

3.2.1 Before parturition

Start feeding formula feed before parturition. It is called 'pre-feeding'.

Start feeding formula feed at latest 3 weeks prior to partirition so that an animal get used to those formula feed. There are various microorganism such as bacteria and protozoa in rumen of animals, which helps fermentation and decomposition of feed. Starting provision of formula feed prior to parturition allow microorganisms adjust themselves with new formula feed so that feed digestion become smooth from a beginning of lactation period. Start initial feeding of 1 to 2 kg per day and increase quantity of formula feed gradually. If an animal is emaciated, feed can be provide upto 3kg per day. However, the maximum quantity should not exceed 3kg per day. The feeding of formula feed should be maintained same till the time of parturition. Feeding formula feed before parturition is important to achieve ideal milk production.

Table 3-5 Formula feed table (before parturition)

	Condition Nutrition	Fatty	Normal	Emaciated
Dry	Before Delivery (3 weeks)	1 kg	2 kg	3 kg

3.2.2 Time of Parturition

Preliminary preparation is important.

In case an animal give a birth in daytime, bring it to shady cool place. If a delivery is in night time, bring it to place near caretaker's residence so that caring of an animal could be easy. Make treatment immediately in hygienic manner. Make sure beforehand which veterinarian doctor is to be contacted at time of emergency such as difficult delivery.' Placenta usually is discharged 6 to 8 hours after delivery. In case placenta is not discharges even after 12 hours after delivery, it is retained placenta. Call veterinary doctor for necessary treatment.

3.2.3 After parturition (Milking period)

(1) Feeding roughage

1) Provide good roughage

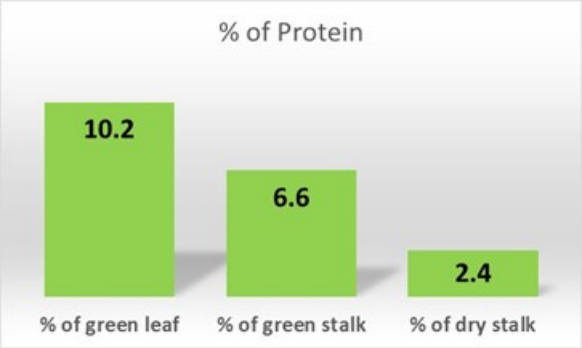
Roughage is important for ruminant animals. Good quality roughage should be given to the animals as much as possible.

It is very difficult to provide good roughage both in quality and quantity constantly throughout lactation period in Sindh province. However, provide nutritious green grass which animals like as much as possible. In case of natural grass, nutritious grass is such as "chabbar" which has many green and soft leaves.
Quality of roughages deteriorates in winter. It is recommended to mix legumes Egyptian clover (Berseem) or alfalfa (Lucern) with roughages for providing necessary protein to animals.

Green -leafy roughages should be provided to the animals. Green leaves contain much crude protein.

Comparing crude protein contents of green leaf, green stalk, and dry stalk, the green leaf contains highest

percentage than green stalk and dry stalk. Good roughage means the green grass with a lot of green leaf. Figure 3-2 is shown crude protein contents of Signal grass (*Brachiaria Decumbens*) in Bolivia. Percentage of crude protein in green leaf, green stalk and dry stalk are 10.2%. 6.6% and 2.4% respectively.



Source: The Beef Cattle Improvement Project in the Republic of Bolivia, Dr. Hideo Tominaga

Figure 3-2 Percentage of crude protein in different parts of grass

Intensive grazing increases a change to intake green leaves and helps to increase nutritive value of feed.

Intensive grazing means that rotation of pasture and suspension frequently. If it is continued that the ratio of green leaf in grazing area per unit will increase. Crude protein will also be increased. Grass in the intensive grazing area for one square meters were cut and sorted into green leaf, green stalk and dry stalk. After that each bunch of the parts were measured a weight. Look at Photo 3-14. You will see a lot of green grass. Ratio of green leaf in intensive grazing area was 86.2%. Green stalk was 8.3% while dry stalk was 5.5%.

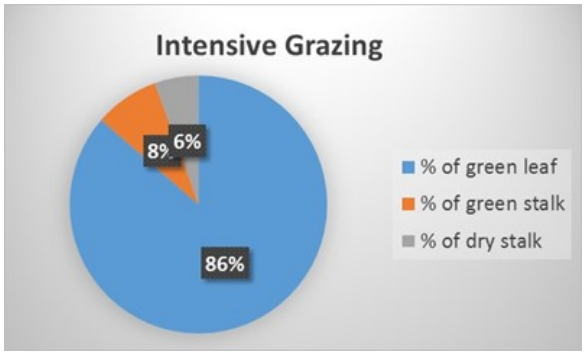


Figure 3-3 Ratio of green leaf, green stalk and dry stalk of intensive grazing

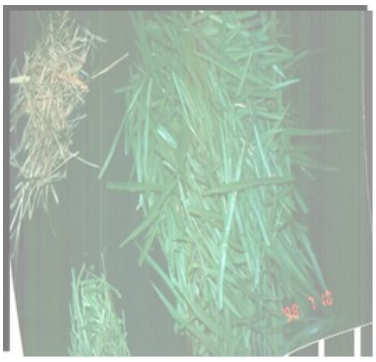


Photo 3-14 Ratio of green leaf, green stalk and dry stalk of intensive grazing

Source: The Beef Cattle Improvement Project in the Republic of Bolivia, Dr. Hideo Tominaga

Extensive grazing increases a chance to intake stems and causes to decrease nutritive value of feed.

On the other hand, extensive grazing is long -term suspension of grazing until grass height will be tall. In this case, total weight of fresh grass was increased, however, green stalk was 74.5% and green leaf which have crude protein was only 17.5%. Dry stalk was 8.9%.

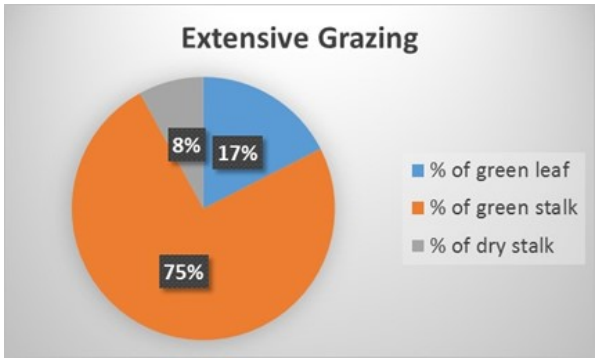


Figure 3-4 Ratio of green leaf, green stalk and dry stalk of extensive grazing

Photo 3-15 Ratio of green leaf, green stalk and dry stalk of extensive grazing

Source: The Beef Cattle Improvement Project in the Republic of Bolivia, Dr. Hideo Tominaga

2) High nutrient roughage

Photo 3-16 Natural grass chabbar

Photo 3-17 Eating chabbar with relish

Photo3-18 Maize, high protein contains in unripe maize

Photo 3-19 Harvesting berseem (Egyptian clover)

Photo 3-20 Harvested berseem

Photo 3-21 Cotton stalk and leaves contains high protein

3) Low nutrient roughage

Photo 3-22 Dried up maize stalk

Photo 3-23 Wheat straw

Photo 3-24 Sugarcane top residues

(2) Feeding formula feed

If profit from milk selling is higher than the cost of formula feed, you will be in surplus. In future, the Project expected that the farmers will buy formula feed by own expenses and obtain more profit from milk production.

Quantity of formula feed

Quantity of formula feed is designed accordingly to nutritious value as body condition and milk production of an animals. Normal condition of animals will be fed with formula feed with quantity prescribed in the middle column below table 3-6. If an animal is fatty, provide the quantity in the left column, whereas in case of weak animals, quantity will be given shown in the right column.

Table 3-6 Formula feed provision table (after parturition)

	Condition Nutrition	Fatty	Normal	Emaciated
Milk production	Milk Prod. Up to 2 Liter	1 Kg	1 Kg	1.5 Kg
	Milk Prod. 2.1～4 Liter	1.5 Kg	2 Kg	2.5 Kg
	Milk Prod. 4.1～6 Liter	2.5 Kg	3 Kg	3.5 Kg
	Milk Prod. 6.1～8 Liter	3.5 Kg	4 Kg	4.5 Kg
	Milk Prod. 8.1～10 Liter	4.5 Kg	5 Kg	5.5 Kg
	Milk Prod. More than 10 Liter	5 Kg	5.5 Kg	6 Kg

Photo 3-25 Technical guidance to feed proper volume of formula feed

Photo 3-26 Formula feed provision during milking time

(3) Quantity of formula feed to be fed should be decided in consideration with the quality and quantity of roughage to be fed to animals.

First of all, it is important to know the quality and quantity of roughages.

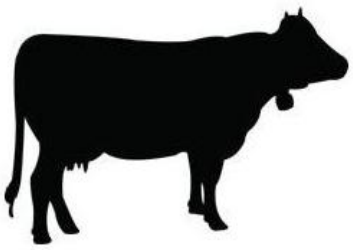
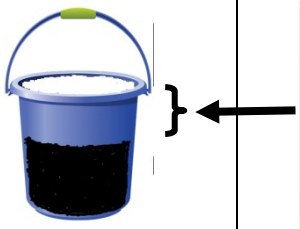
It is not possible to grasp actual stages of roughages (Vegetative, Flowering, Fruit development) provision of each seasons and of each farm correctly and precisely. The project, therefore, presume quality and quantity of roughage provision at a farm with following 3 patterns. 1) Good quality with enough quantity, 2) Mediocre quality with little shortage of quantity and 3) Bad quality with huge shortage of quantity.

Let's feed the formula feed for milking animals according to the pattern of roughage provision in a proper manner..

1) Provision of roughage: In case roughage is good quality with enough quantity

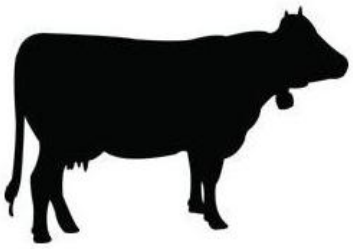
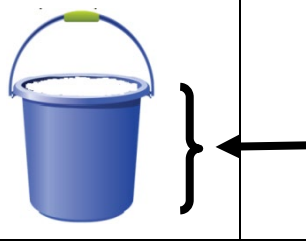
100% of energy to maintain the body can be obtained from roughages and 50% of energy can be obtained from roughage to produce milk.

In this case the 1/3 quantity of formula feed is sufficient which is shown table 3-6 previous page. For instance, normal body condition animal having 5kg milk production per day requires supply of 3kg formula feed whereas same animal fed with enough quantity of good quality roughages requires only 1/3 of prescribed quantity of formula feed, namely, 33% of 3 kg nearly equals to 1kg.

Provision of Roughage	100% energy to maintain body can be obtained from roughage only.	A part of energy to produce milk can be obtained from roughage.	Quantity of formula feed is given1/3 of the above cited table.
1) **Good Quality** 2) **Sufficient Quantity**			

2) Provision of roughage: In case roughage is mediocre quality with little shortage of quantity

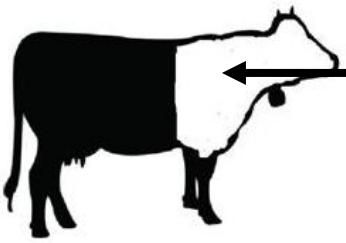
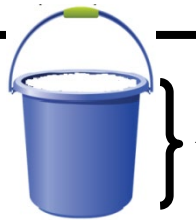
100% of energy to maintain body can be obtained only from roughage. 100% of energy can be obtained from formula feed for producing milk. Therefore, the quantity of formula feed should be provided according to the figure given in the middle column of the table. For instance, normal body condition animal having 5kg milk production per day requires supply of 3kg formula feed.

Provision of roughage	100% energy to maintain body can be obtained from roughage only.	Energy to produce milk cannot be obtained from roughage.	Formula feed is given according to the table above.
1) **Quality is mediocre** 2) **Quantity is less than enough**			

3) Provision of roughage: In case roughage is bad quality with huge shortage of quantity

Only 50% of energy to maintain body can be obtained only from roughage. Remaining 50% of energy for body maintenance and 100% of energy for producing milk needs to be obtained from formula feed. Therefore, quantity of formula feed provided according to the figure shown in left column of the table. For

instance, normal animal body condition having 5kg milk production per day requires supply of 3.5kg formula feed.

Provision of roughage	Energy to maintain body can only partially filled by roughage. (white parts represent deficit of energy)	Energy to produce milk cannot be obtained from roughage.	Formula feed for emaciation condition in the above table is shown. In some cases, more quantity of feed is given to an animal, if necessary.
1) Quality is bad **2) Quantity is not enough**			

(4) Feeding (Pre-feeding and Lead feeding)

Let's learn about pre- feeding and lead feeding to maximize good effect of feeding.
It might make you confuse, but you can do it if you are motivated.
Before start pre- feeding and lead feeding, let's understand standard milk production curve.

Standard Feeding for milking buffalo is shown in Figure 3-5. Below diagram shows relationship between milk production, quantity of given formula feed and body condition of animals. The milk curve in diagram shows milk curve of 10 months of the lactation that is ideal milk production peak. (4 boxes in a column indicates one month)

Comparison of milk production, supply of formula feed and body condition of a buffalo are shown in Figure 3-5. Yellow part shows the milk production.

When enough formula feed is given to animals with proper feeding management, buffaloes can produce their full capacity of milk production and it can show this type of ideal milk curve.

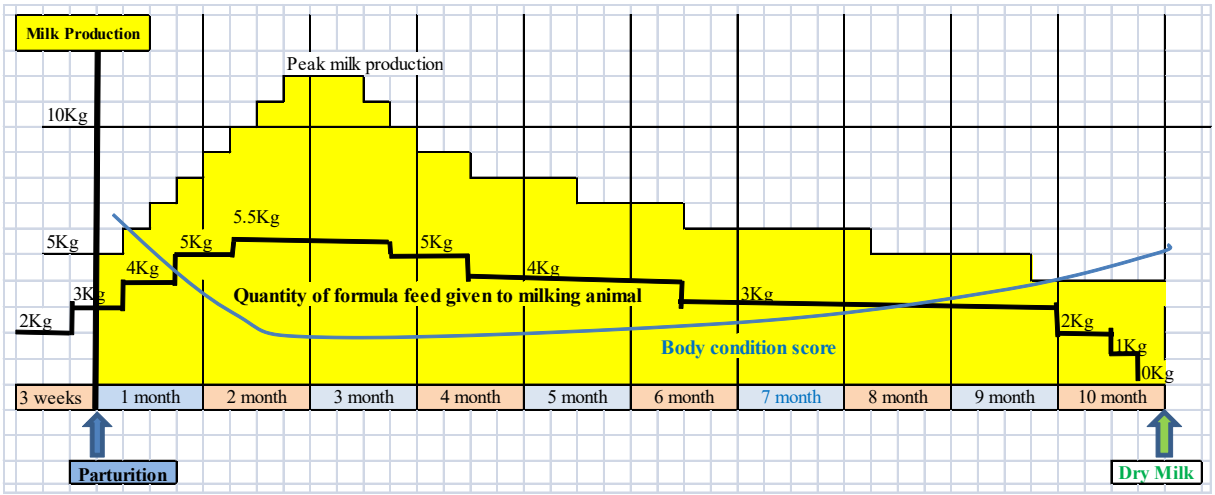


Figure 3-5 Standard Feeding for milking buffalo

1) Pre-Feeding

At least 3 weeks before parturition, formula feed should be given to a cattle/buffalo to be familiar with existing bacteria and protozoa in the rumen. It is recommended to start from 2 kg per day and increase the volume of feeding up to 3kg per day.

2) Lead Feeding

After parturition, milk production will be increased gradually. Therefore, formula feed should be increased accordingly with milk volume. So it is called lead feeding. The peak level of milk volume will be reached at 2 to 3 months after parturition. During this period, milking animal cannot produce milk from energy obtained from feed only. Thus, cattle/buffalo utilizes accumulated nutrients of their body for producing the milk, which results the loosing of body weight. Blue line of Figure 10 shows Body Condition Score (BCS) Curve. It will be declined gradually after parturition. When milk production declines after peak level, a cow cattle/buffalo will start to re-gain weight. From this stage, the volume of formula feed should be reduced.

3.2.4 Dry period management

Dry period is important for normal functioning of mammary glands, that should be at least 30 days.

When milk production of animal gradually decreases towards post lactation period, reduce the quantity of formula feed supply gradually.

At last, only roughage should be given to a cattle/buffalo and continued milking for few days. Milk production will be reduced and udder started to shrink. This is appropriate time to stop milking and start of dry period.

Dry period is important for resting udder and renewing mammary gland cells for next lactation.

3.3 Other challenges for increase milk production

Ideal milk curve and stable milk production are proof that your cattle/buffalo is showing their capacity. To realize ideal milk curve, good quality of formula feed needs to be supplied accordingly to animal milk production. However, ideal milk curve cannot be obtained only by that. There are many other factors which affect milk production of animals. Let's look into those factors and try to improve those factors.

3.3.1 Enough drinking water

Does your milking cattle/buffalo drink enough fresh water? It is very important to give enough and fresh water to a cattle/buffalo because it will directly affect milk production volume.

(1) Required amount of drinking water

Requirement of water per day varies with temperature, breed and milk volume.

According to the reference, water requirement of each breed are as follows. It is necessary to give enough water to animals.

*Holstein: 60 liters (Winter:100 ~Summer:150 liters)

*Cross breed of European breed and Zebu breed :60~80 liters

* 6~10 liters of water are required to produce 1kg of milk

(2) Methods of Water supply

There are 2 ways for water supply, namely, free water supply and limited water supply.

1) Free water supply

If you prepare a big water trough to put water which a cattle/buffalo cannot consume it one time, you will achieve the target to secure the water for a cattle/buffalo, however, there is a disadvantage. If you don't wash it regularly, water will be dirty. Then, it will be harmful for animal health. Frequency of water container cleaning depends upon season and size of the container. It is very important to decide frequency of cleaning and wash the water container regularly. To recover a disadvantage of the big water container, Water cup has been used in the developed countries. It is a small container with 30 cm diameter. If a cattle/buffalo push a small bar, water will come out on the cup. Therefore, a cattle/buffalo can drink fresh water every time. If you have tap water, it is easy to install and use it. The price of water cup is low.

Example of water trough for free water supply:

		
Photo 3-27 Drum water trough	Photo 3-28 Concrete water trough	Photo 3-29 Water Cup

2) Limited water supply

In case of rural farmers, limited water supply which three times per day morning, daytime and evening is common practice. It is recommended to increase one time before you sleep.

3.3.2 Cleaning of feed trough

Leftover in feed trough should be thrown away every day. Do not give leftover to a cattle/buffalo again.

It is very important that leftover feed (roughage and concentrate) should be thrown away and fresh feed should be given to a buffalo. It is also important that try to grasp daily feed consumption of a cattle/buffalo through daily observation and avoid to have leftover as much as possible.

	
Photo 3-30 Wasted roughage by trampling	Photo 3-31 Wasted feed by adding feeding

	
Photo 3-32 Deteriorated feed in under layer	Photo 3-33 Deteriorated crumps of bread and chapatti

3.3.3 Length of roughage

It is important that make a cattle/buffalo eating roughage as much as they can. Length of roughage will affect this.

If you have a chopper, cut roughage in the length of 1 – 2 cm. If you don't have the chopper, cut grass with knife and/or sickle in the length of 5cm.

	
Photo 3-34 Effective use of a chopper	Photo 3-35 Cut into length that animals easily can intake

3.3.4 Countermeasure against heat

It is important to secure the place where cool with good ventilation and cool the body of a buffalo by bathing or sprinkle water. It is also important not to expose buffaloes to direct sunshine in the hot season.

There are many microorganisms and bacteria in the rumen. They will discompose hard fiber of plants. Rumen capacity of cow cattle/buffalo is 200 liters. Rumen is like a fermentation machine and radiates a lot of heat.

Heat stress of cattle/buffalos will increase if temperature is high because rumen is radiating heat. In this situation, cattle/buffalo cannot show their capacity and produce expected milk production.

(1) Shade with good ventilation

Wind direction should be check in each season. In summer season, you need to tie your cattle/buffalo where no high walls or other obstacles in wind direction.

*In case of tree shade: tree which has many leaves such as mango is better than a tree which does not have many leaves such as acacia because it will provide good shade for animals.

*In case of simple roof: a high roof has good ventilation. It should be improved or newly installed. If you incline roof by using poles its height at least 2.5m as rear poles and more than 2.5m as front poles, you will get good ventilation.

Photo 3-36 Mango trees

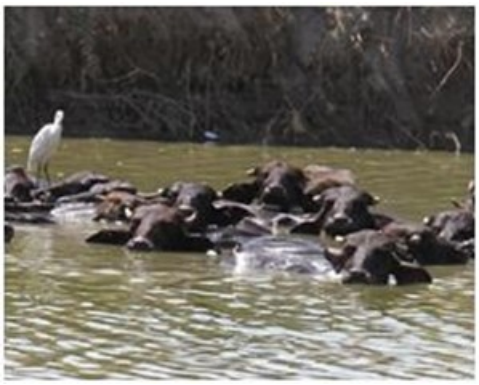
Photo 3-37 Tying buffaloes under the tree shade with good ventilation

Photo 3-38 Roof with good ventilation

(2) Bathing

Buffalo needs bathing. Compared to zebu cattle, buffalo is less resistant against heat. Bathing is, therefore, important for buffalo to produce consistent quantity of milk.

Bathing is highly effective than a shower to cool body temperature of a buffalo down. For bathing, a deep place is better than a shallow place. Try to find the deep place for bathing. However, if the bathing place is far from your resident more than 30 minutes by walk, you should not go for bathing because a buffalo will lose their energy.

	
Photo 3-39 Bathing in shallow water (Second-best)	Photo 3-40 Bathing in deep water. Animals can soak whole body into the water. (Ideal)

(3) Shower

If there is no proper place for bathing or a bathing place is very far, use a shower to cool the body of a buffalo down. During hot hours in a day, the shower should be given to a buffalo multiple times with intervals.

There are two methods for a shower. One method is that directly shower water from a hose. Another method is using buckets. You have better stop to give a shower for a buffalo at tying place because the floor will be wet and sanitary condition will be getting worse. After securing a shower place, maintain floor and make drainage. Floor will be improved easily by materials such as brick, block and logs. If you give a shower to a buffalo at tying place, it will be better to use a knapsack type sprayer so that you can avoid wetting the floor.

		
Photo 3-41Shower with water hose is less effective	Photo 3-42 Floor improvement of shower place	Photo 3-43 Knapsack type spray

3.3.5 Facility for dairy farming

(1) Simple milking shed

The Project developed the simple milking shed made of MS pipes. In consideration with strength level of MS pipes, light weight reeds are applied as roof materials instead of heavy bamboos. For a floor, concrete slab designed by the Project is applied (refer to page 17).

1) Materials and cost

Simple milking shed for 4 numbers of milking buffaloes are shown in the Figure 3-7 to Figure 3-10. Materials used for this shed are shown in Table 3-7.

Table 3-7 Materials and cost for Simple milking shed construction

Name of materials	Spec of materials	Number of required piece	Unit price (Rupees)	Subtotal (Rupees)
MS pipe	Diameter 48mm Thickness 3mm Gauge 10 Length 20 feet (6m) See Photo 3-44	18	2,400	43,000
Universal cramp	See Photo 3-45	34	285	9,690
Fixed cramp	See Photo 3-45	21	285	5,985
Concrete slab for floor	Length100cm Width50cm	30	350	10,500
Total cost of Simple milking shed for 4 numbers of milking buffaloes(Rupees) As of January2018				69, 175

Photo 3-44 MS pipe

Photo 3-45 Flexible cramp (left) and Fixed cramp (right)

2) Direction of the shed

If you construct a wide milking shed, it is better to set the side of milking shed to the direction of east and west as shown in Figure 12 to avoid strong sunlight entering the shed. If you construct the shed to the direction of south and north, it is recommendable to plant shed trees in the west as shown in Figure 13to soften direct sunlight to the shed because evening sun is very strong.

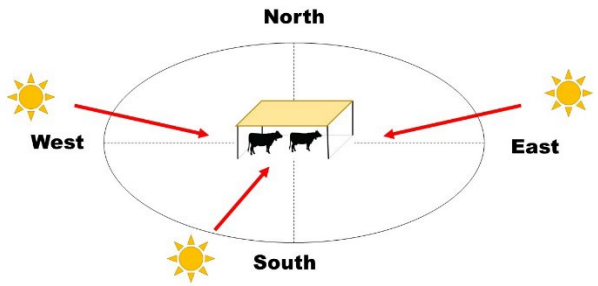


Figure 3-6 Ideal direction of the simple shed

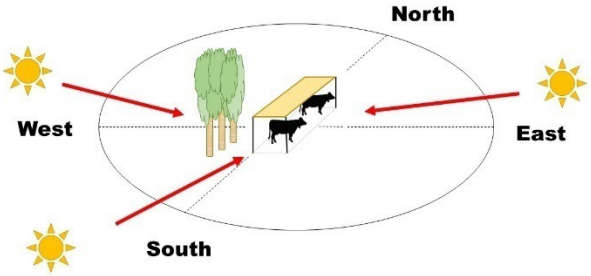


Figure 3-7Soften direct sun light to the simple shed by shade trees

3) Advantages of this milking shed model

This simple milking shed is easy to install and effective as mentioned below;

- Simple milking shed allows to feed appropriate quantity of formula feed to each milking cow individually.
- Simple milking shed allows to milk in hygienic manner on the proper floor under the roof.

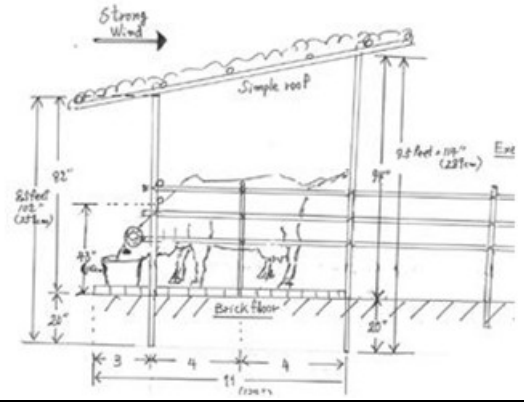


Figure3-8 Side view of simple milking shed

Photo 3-46 Roof of simple milking shed

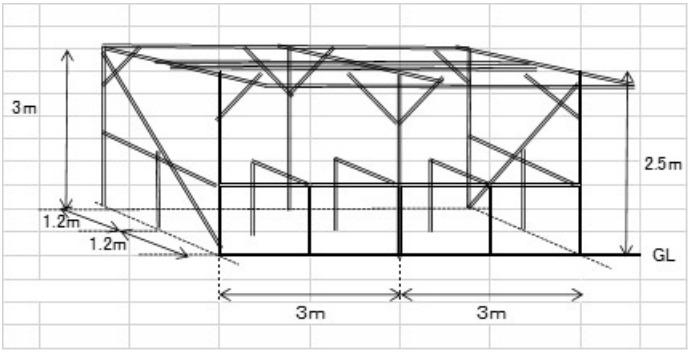


Figure 3-9 Diagonal view of framework

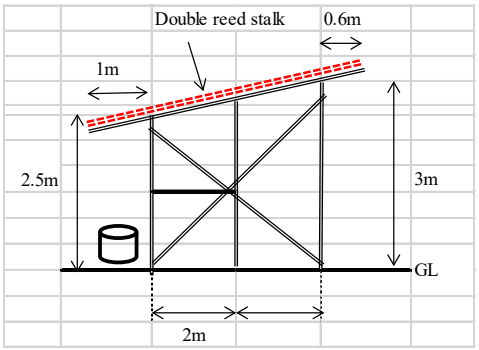


Figure 3-10 Side view of framework

(2) The tie method

1)Tying in a line:

Place milking cow/buffalo in one line. Place 1 feed trough for each cow/buffalo. In between 2 cow/buffaloes, place 1 water trough or water cup for 2 cow/buffaloes.

In case tying milking cow/buffaloes, it is suitable to tie at their neck or use bridle, which is convenient to milk and give feed.

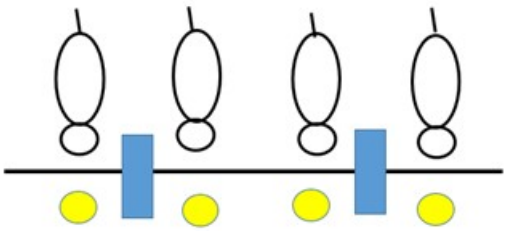


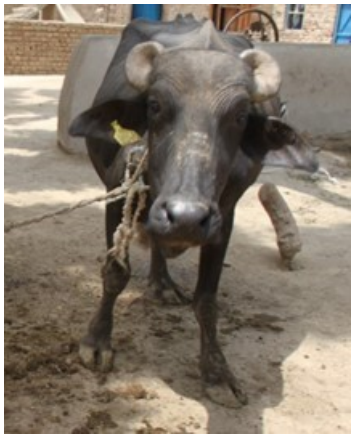
Figure 3-11 Tying in a line for four animals

Photo 3-47 Water trough for free access to water

Photo 3-48 Bricks should be placed between concrete slabs

2) Body parts to be tied

Neck or Bridle: Tying at neck or bridle give less stress to cattle/buffaloes. It also allows easy management of feeding and drinking water. It is good for preventing cattle/buffalos from fighting each other next to them, as well. Rope or chain used for tying should be tied and fixed with either feed trough or pillar firmly. It is not suitable to tie with a small post since a post because easily pulled out from the ground. The length of a rope or a chain should be long enough for cattle/buffaloes to eat and drink from trough.

	
Photo 3-49 Tying with brindle	Photo 3-50 Typing at neck

(3) Paddock

The Project verified the effectiveness of paddock made of log and bamboo and paddock made of MS pipes. Both models have following advantages.

- Paddock allows cattle/buffalo proper exercise by walking freely in the paddock. Paddock allows cattle to drink water freely.
- Paddock allows farmers easily find detection heat of female cattle by mounting each other.
- Paddock allows to improve conception rates by having bull together with female cattle/buffalo in the paddock.

	
Photo 3-51 Paddock made of wooden log and bamboo	Photo 3-52 Free walking and free access to water inside the paddock

3.3.6 Grazing

Grazing brings several benefits such as promoting healthy growth of young cattle, detecting heat phenomenon of cow, reducing labor for bringing green fodder from field to farm and so on. In addition, grazing allows cattle eat various kinds of roughage from a field including micro minerals, which often in short in roughage given to tied cattle.

As for milking cow, however, it is better not to graze in distant area during hot season or in a field where little fodder is found. Grazing in such conditions lead to loss of energy of milking cow result in decrease of milk production.

Some farmers bring cattle walk to the place in 1-hour walking distance. Walking more than 30 minutes will

loss unnecessary energy of cattle, especially for the case of milking cow.

When cattle are grazed in a field with plenty of fodder, they eat fodder slowly and ruminate gradually. In case they are grazed in a field with little fodder, they walk longer distance to search for fodder result in loss of more energy.

		
Photo 3-53 Walk in a long distance will cause energy loss	Photo 3-54 Insufficient fodder in a grazing field	Photo 3-55 Grazing in post-harvest cotton field

3.3.7 Hoof-cutting

If cattle are not grazed for enough hours, regular hoof cutting by technician once in 6 months are needed.

Hoof of cattle and buffaloes are same so as management of hoof. If cattle are grazed for about 8 hours in a day, hoof of those cattle are worn away naturally and remained in a proper shape. Hoof cutting is not necessary in those cases.

Hoof grows 5mm length in a month while there is slight difference in breed, management condition or individual cattle. Monthly 5mm growth result in 6cm growth in a year.

If cattle are not grazed or less frequently grazed, hoof of them will grow like shown in the photo below.

Cattle support their heavy body with 4 legs. Long hoof will give stress to cattle. Sometimes it leads to arthritis or lameness, which also affect milk production.

Hoof cutting is, therefore, important.

	
Photo 3-56 Hoof-cutting by a technician	Photo 3-57 Comparison before and after hoof-cutting

3.3.8 Appropriate milking method

Apply appropriate milking method for preventing mastitis and production of hygienic milk.

Figure 3-28 & 29 Pour 2ml of Dettol into 4 liter of water, and dip a towel wring out well.

Figure 3-30 Now animal is ready for milking.

Figure 3-31 Allow a calf to suck for stimulation. Clean teats with a prepared towel. If udder is dirty, wash it and wipe with a towel.

Figure 3-32 & 3-33 Change a towel for each cow. Wash your hands before milking another cow / buffalo.

Figure 3-34 & 3-35 Wash towels and buckets with a soap when you finish milking.

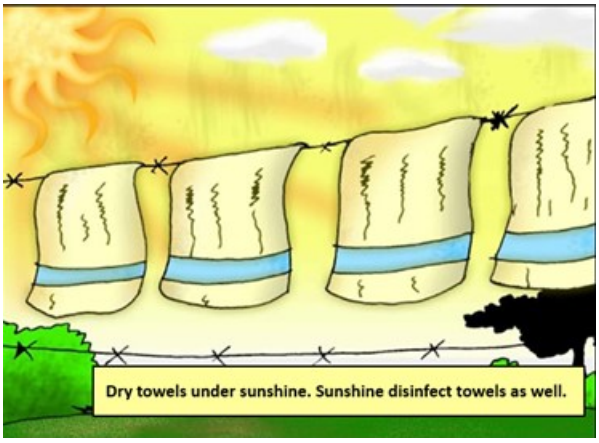


Figure 3-36 Dry towels under sunshine thoroughly. (Sunshine disinfects the towels).

3.3.9 Body Condition Scores (BCS) PSLD of Kundhi buffalo

Let's learn about 5 levels of Body Condition Score (BCS) for cow. BCS changes over the period of early lactation, peak lactation, late lactation and dry. BCS within normal range is in between 2.5 and 3.5. BCS below 2.5 is regarded as underweight, which needs supplementary feed. BCS above 3.5 is regarded as overweight, for which feed needs to be reduced. Too fat and too skinny adversely affect conception rates and milk production.

Body Condition Scores (BCS) are closely related to feeding management, reproduction management, animal health management and genetic improvement of cattle and buffalo. It can be applied for various field.

In particular, Fatty (BCS more than 4.0) during dry period will cause various perinatal disease such as fatty liver, ketosis and hypocalcemia because a buffalo will reduce their weight rapidly after parturition and massive free fatty acid will developed from body fat.

Body Condition indicates 'condition of body fat accumulation' while BCS indicates 'the numerical value of the body fat accumulation'. BCS is easily determined by visual inspection and palpation. Let's learn about BCS.

Rough estimate of simple BCS are 'weak 2.0', 'normal 3.0' and 'Fatty 4.0'. These scores are developed for Kundhi buffalo, however, it can be applied for Zebu cattle and a crossbreed of Zebu and European cattle.

(1) How to determine BCS

1) Basic visual inspection and palpation should be done from the left side of a buffalo because the left side skin is loose and elastic.
2) BCS is determined with 0.5-point increase, 2.0, 2.5, 3.0, 3.5 and 4.0.
   It is originally 0.25-point increase, however, 0.5-point increments are easier and it can also achieve targets.
3) Visual inspection and palpation
   First, visual inspection and palpation on hip bone and pin bone should be conducted to check whether there is subcutaneous fat or not. Then, visual inspection for ribs of the flank, transvers process of vertebra, sacral ligament and pin bone ligament should be conducted.
   - If there is no subcutaneous fat on bones, you should check whether the lines of bones are clearly recognized.
   - If there is subcutaneous fat on bones, you should check that the lines of bones cannot be recognized due to round shape.
   - In case of fatty, you will feel elastic skin because of fat accumulation if you push the root of a tail.

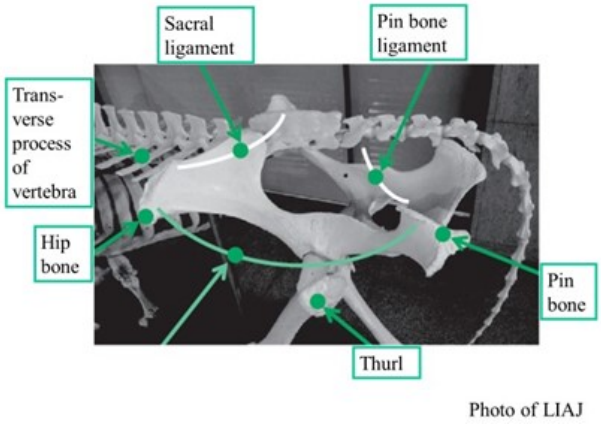


Photo 3-58 Skelton of cow is used for BCS determination

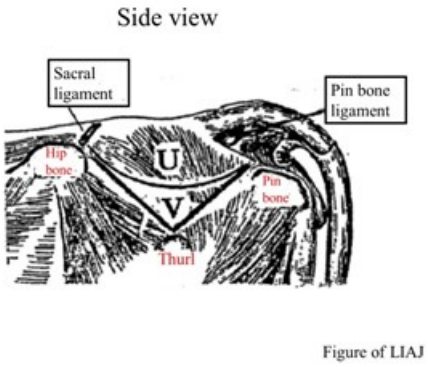


Figure 3-37 Rear body of buffalo is used for BCS determination

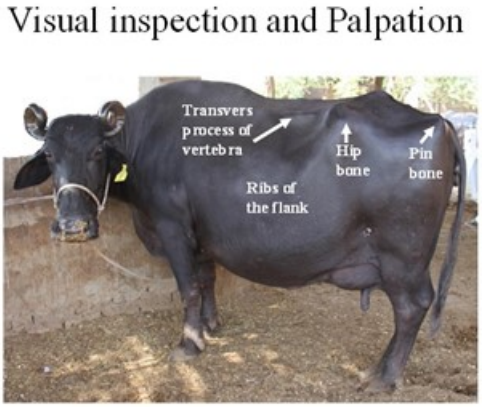


Photo 3-59 Check points for BCS determination

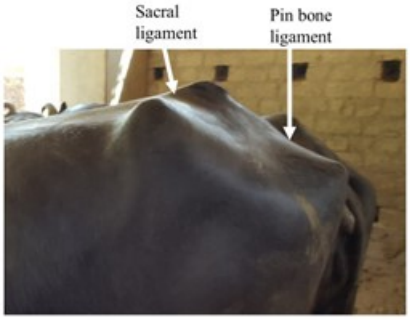


Photo 3-60 Ligaments are used for BCS determination

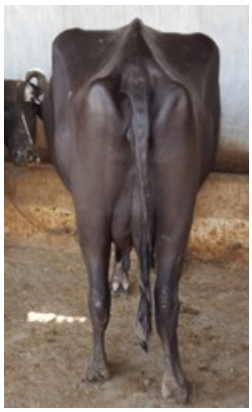


Photo 3-61 Very weak; Under the tail is deeply indented

Photo 3-62 Fatty; Fat accumulation is recognized under the tail and side of the body

Photo 3-63 It is dented in a finger

4) Determination

【BCS 3.0】

- If there is subcutaneous fat on hip bone and pin bone even a little, BCS is determined as 3.0. The obscure lines of ribs of the flank, transvers process of vertebra, sacral ligament, pin bone ligament can be recognized by visual inspection. BCS3.0 indicates normal nutrient condition. In case of lower limit of BCS 3.0, you will recognize obscure lines of ribs of the flank. In case of upper limit of BCS 3.0, you will recognize obscure lines of transvers process of vertebra, sacral ligament and pin bone ligament.

【BCS 3.5】

- If there is subcutaneous fat on hip bone and pin bone even a little, BCS is determined as 3.0. If you cannot recognize the shape of ribs of the flank clearly (weak line) and can recognize transvers process of vertebra, sacral ligament, pin bone ligament in slightly round shape, BCS is determined as 3.5.
- If pin bone and hip bone are covered by thick subcutaneous fat and recognized in round shape, BCS is determined as 3.5.
- If there is fat under the tail, BCS is determined as 3.5.

【BCS 4.0】

- If there is subcutaneous fat on hip bone and pin bone; line of ribs of the flank cannot be recognized; and transvers process of vertebra, sacral ligament and pin bone ligament are clear round shape, BCS is determined as 4.0. If you push the root of a tail, you will feel elastic skin because of fat accumulation.

【BCS 2.5】

- If there is no subcutaneous fat on hip bone, however, there is on pin bone, BCS is determined as 2.5.
- If there is subcutaneous fat on hip bone and pin bone even a little, BCS is determined as 3.0. However, if the line of transvers process of vertebra is clearly recognized, BCS is determined as 2.5.
- If there is no subcutaneous fat on hip bone and pin bone, BCS is determined as 2.0. However, if the lines of ribs of the flank, transvers process of vertebra, sacral ligament and pin bone ligament are shown in slightly round shape, BCS is determined as 2.5.

【BCS 2.0】

・ If there is no subcutaneous fat on hip bone and pin bone; and there are clear lines of ribs of the flank, transvers process of vertebra, sacral ligament and pin bone ligament, BCS is determined as 2.0.

(2) BCS for each lactation period

Ideal average BCS for each lactation period are 3.5 for during parturition, 3.0 for peak of lactation, 3.25 for middle of lactation, 3.5 for late lactation and 3.5 for dry period.

Table3-8 BCS for each lactation period

BCS each period

Period	Average
Cows at calving	3.5
Peak of lactation (50 ～60 days)	3.0
Mid lactation (100 ～200 days)	3.25
Late lactation (200 ～305 days)	3.5
Dry period	3.5

(3) Photos in different level of BCS

Photo 3-64 BCS 2.0

Photo 3-65 BCS 2.5Side View

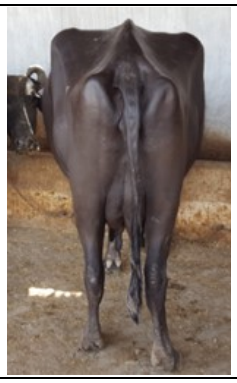


Photo 3-66 BCS 2.5Rear view

	
Photo 3-67 BCS 3.0	Photo3-68 BCS 3.5

	
Photo 3-69 BCS more than 4.0, Side view	Photo 3-70 BCS more than 4.0, Rear view

Chapter 4 How to rear calves

4.1 Let's grow the calves which have god appetite for feed

Calves which have good appetite for feed will grow up to an adult female mother buffalo which have good appetite for feed.

An adult female mother buffalo which have good appetite for feed has large rumen and a deep body. Such adult female mother buffalo will no doubt to produce good quantity of milk. In addition to good milk production, those buffalo will conceive more and will produce milk for longer duration in her whole life. The milk production capacity of adult female mother buffalo depends largely on ways and management of rearing calves during early period of their growing, i.e. their sucking and weaning period.

4.2 Stomach of large ruminants

Large ruminants such as cattle and buffaloes have 4 stomachs.

Stomach of large ruminants includes rumen, reticulum, omasum and abomasum. Abomasum functions same as human stomach. There are thousands of bacteria and protozoa in rumen of adult animals. Those bacteria and protozoa ferment and decompose feed. The rumen of adult animal occupied 80% space of their stomach and abomasum which functions as human stomach is small. The rumen of newly born calf, however, occupies only 30% space of their stomach. It is very important to grow calves so as to enhance their rumen, which should be started from their early age.

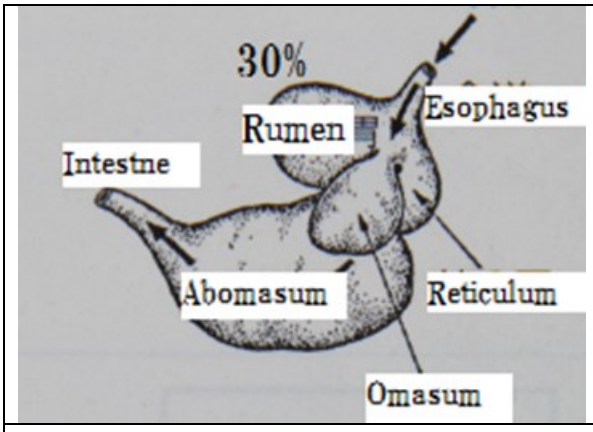


Figure 4-1 Stomach of a calf (Rumen occupies 30% of stomach)

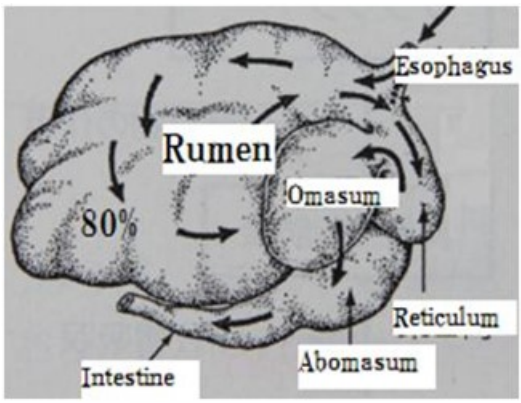


Figure 4-2 Stomach of an adult buffalo (Rumen occupies 80% of stomach)

4.3 How to develop rumen of calves

4.3.1 Let's develop rumen of calves

In this section, how to develop rumen of calves will be explained.

1) Start feeding calves with good quality of green grass from 2 weeks after their birth.

Good green grass is fibrous green leafy graminae grass. Fibrous grass gives good stimulus to calves' rumen, which allows their rumen to grow. In the beginning, calves' intake of grass is very small quantity. But they will start eating good amount of grass gradually.

2) Feeding Hay

Rumen of calves is small. Green grass contains much water. 70% of green grass volumes are water. If calves take green grass, their small rumen becomes filled with water. Intake of green grass, therefore, will not allow calves to take enough nutrition. Hay is good alternative for green grass. Hay is not only given sufficient nutrition to calves but also prevent them from diarrhea which is common and frequent disease for calves.

4.3.2 How to prepare good quality of hay

Hay is made of green grass by deducting water content to less than 15%, which helps to restrain function of enzyme and microorganism so that they can be stored for a long time without deteriorating its quality. Natural grass and graminae grass such as star grass are preferable for making hay for calves. Stalk of Sorghum and Maize are too hard fiber and are not suitable for calves.

Sunshine in Sindh is strong. Drying one and half day under the sunshine is enough for grass like chabbar to prepare as hay. Cut grass in a morning and spread them under the sun and turn them over every a few hours. Pile them up in a night to prevent from dew. Cover them with vinyl sheet, if necessary. On next morning when sun rise, spread grass over again and turn them over every a few hours. Hay becomes ready by an evening of second day. 1kg of hay can be made from 5 kg of green grass.

4.3.3 Feed good quality hay to calves in good quantity.

It is recommended to feed hay to calves up to 8 months of their age. Irrigated land has advantage of availability of green natural grass throughout the year thanks to irrigated water. Adult animal consumes large quantity of roughage whereas intake of 6 months' age calves is small. The priority, therefore, should be given to calves. Natural grass can be stored for a longer duration. It is recommended, therefore, to cut as much grass you can when your time allows and store them as hay.

Photo 4-1 Chabbar which is widely available in the area

Photo 4-2 Technical guidance on hay preparation

Photo 4-3 Calves are delighted to eat hay

4.4 Cow cattle/buffalo management during parturition

A cow will lose its calm if it is near to parturition. For proper delivery assistance, you should tie the cow near to your resident and carefully observe it.

You should also contact a reliable veterinarian who can help you in emergency case such as difficult delivery beforehand. In case of a delivery in night time, you should attend a birth and help as much as possible to avoid an unexpected accident.

4.5 Calf management right after its birth

First things you have to do right after their birth to grow healthy calves

(1) Drying of calf's body

Dry calf's body by allow mother buffalo to lick calf's body. Licking stimulates hormone secretion of mother buffalo as well as facilitates discharge of placenta.

(2) Disinfection of umbilical cord

Umbilical cord needs to be either disinfected with 10% iodine tincture solution or inject iodine solution into umbilical cord.

Photo 4-4 The umbilical cord should be disinfected by dipping into. Iodine Tincture solution

(3) Intramuscular injection of antibiotic

Injection of antibiotic is recommended for those calves born to a farm where many of calves get disease, in humid season right after the rainy season and in winter season. Intramuscular injection of 3ml of OTC-LA is performed.

(4) Place for rearing

The calf should be rear at dry and clean place. In case of hot season, the place where there are moderate shade and good ventilation should be chosen for calf rearing. In case of winder season, you put straw down on the ground and avoid strong wind. Cleaning should be done regularly to keep cleanness of rearing place.

(5) Good observation of suckling calves

Once suckling calves become sick, their condition often can easily and quickly deteriorate.

You should always observe movement of the calf carefully. If the calf has shining eyes, moves around vigorously and not shows dirty on the surroundings of the buttocks, the calf is in health. It is important to make a habit of observation about the calf such as color of droppings, times of breathing, having or not having fever, times of diarrhea.

(6) Colostrum

Feed colostrum to a calf within 6 hours of its birth.

It is important to feed colostrum to a calf for the prevention of infectious diseases.

Especially, the first colostrum is highly effective because it includes a lot of gamma globulin. The first suckling of colostrum should be done within 3 hours after delivery. The second suckling of colostrum should be done within 6 hours after delivery. It will be better if the calf sucks colostrum as much as possible.

After 6 hours of its birth, a calf cannot absorb gamma globulin contained in colostrum. Colostrum or milk in 3 to 5 days after parturition cannot be sold as milk, but it contains more nutrition than normal milk. Feed such colostrum as much as possible to a calf.

4.6 Separate rearing of mother cow and calf

Dairy farming of the developed countries rear mainly European cattle. After a delivery, a mother cow will be allowed to lick calf's body. The mother cow and the calf will be separated immediately after birth.

In tropical countries including Sindh province, Pakistan, Milking is carried out after suckling of calf. This is traditional method for milking to help secretion of oxytocin (lactogenesis hormone) by stimulation of calf suckling. It is believed that it is impossible to milk cows without calf suckling. However, innovative farmers in Italy and Thailand, they rear buffalo it is called *Murrah* breed, and carried out milking without calf suckling. Moreover, milking is done by a milking machine. Following pictures are shows example of Thailand. Separate rearing of mother cow and calf. It is possible if you make mother cow adjust to the situation.

	
Photo 4-5 Sucking of calf which separated from their mother right after their birth	Photo 4-6 Milking of a buffalo by milking machine

Even in Sindh, farmers apply massage before milking without calf suckling. This method is applied when a calf died during lactation period. The below photo is the case from district Matiari.

	
Photo 4-7 Massage of the teat	Photo 4-8 Normal milking after massage

4.7 Rearing calves at small scale farms

Application of early weaning practiced in the calf salvation center is difficult at small scale farms. Small scale farms require time to adopt new technologies including proper milk feeding, free access to drinking water and 24 hours provision of calf starter and hay. The Project developed feeding unit to facilitate early weaning at small scale farms. With the use of this feeding unit, a calf can access to drinking water, calf starter and hay for 24 hours.

Photo 4-22 Feeding unit distributed to small scale farms

4.8 Weaning at 4 months of age

Early weaning is not possible in case nutritious condition of a calf is not good due to insufficient milk and quality roughage even though introducing feeding unit. In such a case, weaning at 4 to 5 months of age is recommended. Traditionally, calves are weaned at 4 to 5 months at small scale farms in Sindh.

Weaning methods at 4 months of age is explained below;

(1) Feeding management during suckling period

Quantity of milk fed in the beginning is same as early weaning method. Feed colostrum on day 1 to 5 after birth. Feed 1.5 kg of colostrum at a time. Feed 2 times in a day. Total 3 kg of colostrum per day is to be fed. On day 6 and 7, feed 1.5 kg of milk at a time, 2 times in a day. Total 3 kg of milk per day is to be fed. From 2nd week to 8th week, feed 2 kg of milk at a time for 2 times in a day. Total 4kg milk per day is to be fed. From 9th week, reduce quantity by 1 liter. Feed 1.5 kg at a time for 2 times in a day. Total 3 kg per day is to be fed. From 13th week, reduce quantity by 1 liter. Feed 1 kg at a time for 2 times in a day. Total 2 kg per day is to be fed. Wean on 17th week.

Table 4-5 Quantity of milk fed

Month	Week	Day	Body weight (Kg)	Milk (Liter)/day
1st Month	1 week	1 ～ 5	34	Colostrun 1.5L x 2 times=3L
		6 ～ 7		Milk 1.5 L x 2 times = 3L
	2 Weeks	8 ～ 14	37	Milk 1.5 L x 2 times = 3L
	3 Weeks	15 ～ 21	41	Milk 2.0 L x 2 times = 4L
	4 Weeks	22 ～ 28	45	Milk 2.0 L x 2 times = 4L
2nd Months	5 ～ 8 Weeks	29 ～ 56	48	Milk 2.0 L x 2 times = 4L
3rd Months	9 ～ 12 Weeks	57 ～ 84	77	Milk 1.5 L x 2 times = 3L
4th Months	13 ～ 16 Weeks	85 ～ 91	92	Milk 1.0 L x 2 times = 2L
	17 Weeks	113 ～ 118		Milk 0.5 L x 2 times = 1L
		120	107	0 L Wean

Provide calf starter and hay for 24 hours. It is ideal that a calf intake 1 kg hay at 3 months of age. Provide drinking water for 24 hours. From 4th months start mixing formula feed for growing heifers with calf starter gradually to shift from calf starter to formula feed. At the end of 4th month, replace calf starter completely with formula feed and wean.

(2) Feeding plan in different age of month

Table 4-6 Feed table for a calf

Month	Day	Body weight (Kg)	Milk (Liter)/day	Calf starter (Kg)/day	Formula feed for rearing calf (Kg)/day	Hay (Kg)	Green grass	Water
1 month	1 ～ 30	45	Average 3.5	Average 0.2	-	Little	-	Free
2 months	31 ～ 60	62	4	Average 0.5	-	Free	-	
3 months	61 ～ 90	77	3	Average 1.0	Average 0.5		-	
4 months	91 ～ 120	92	Average 1.5		Average 1.5		-	
5 months	121 ～ 150	107	-	-	2		-	
6 months	151 ～ 180	122	-	-	2		-	
7 months	181 ～ 210	137	-	-	-		2	
8 months	211 ～ 240	152	-	-	-	Little	9	
9 months	241 ～ 270	167	-	-	-	-	15	

4.9 Judgment of nutrient condition of calf

Let's learn 4 stages of nutrient level of calf

Level 4: Fatty: It is fatty and its whole body is covered by fat. Hip bone and rib bone cannot be recognized. Fatty calf will have physiological problems easily. It is needed to reduce amount of feed to keep proper weight.

Level 3: Normal: Desirable nutrient condition

Level 2: Slightly weak: observe calf carefully and add some concentrate or formula feed if necessary.

Level 1: Very weak: check whether calf has a disease and carry out necessary treatment and drenching. After that add some concentrate or formula feed.

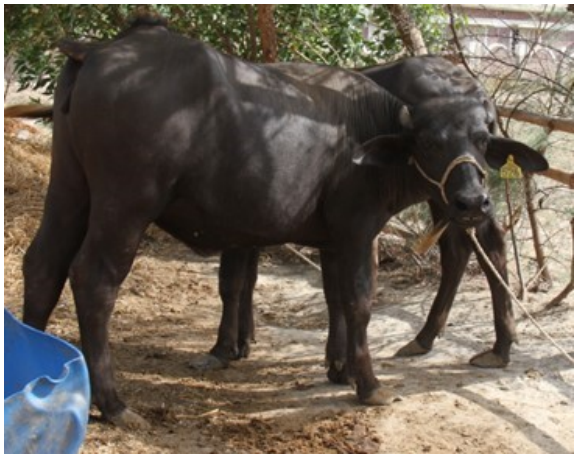


Photo 4-23 Level 4: Fatty	Photo 4-24 Level 3: Normal

	
Photo 4-25 Level 2: Slightly weak	Photo 4-26 Level1: Very weak

4.10 Preventive measures against heat for a calf

Heat preventive measures are important for calf rearing.

Bathing of a calf can be started from 6 months of its age. Heat preventive measures in hot season are important. Secure airy and shady place for calves. Sprinkle water over the surrounding area to reduce air temperature. Water spray can be used to sprinkle water over a body of calves every 30 minutes during excessively hot hours of the day so that the temperature of body surface of calves can be decreased.

Photo 4-27 Sprinkling water over calves with knapsack type spray

4.11 Preventive measures against calf diarrhea

There are two major causes of diarrhea.

1) Improper nutrition and feeding management

2) Infectious diarrhea caused by bacteria, virus and internal parasites.

Countermeasures for calf diarrhea such as timely diagnosis, proper treatment and prevention are explained as below;

Physiological diarrhea and transient diarrhea

There is no need to treat in this case of diarrhea. Symptoms are as follows;

- Frequency of scours is once in a day
- Color of scours is white or yellow
- Calf is moving with its tail lifting up

(1) In case of lethargic calf

In this case following points should be checked.

1) Checking Dehydration:

Pull neck skin of calf. If the skin is tense or no elasticity, and eye balls recede into their sockets are the symptoms of dehydration.

2) Measurement of body temperature:

In general, normal body temperature of calf is higher than the adult animal. The normal range is 101.5-102ºF (38.1-39.2ºC). If the measurement shows high temperature beyond this range, calf has a fever.

(2) Treatment for dehydration

It is important to maintain the moisture in a body of calf. If calf is still vigorous, oral rehydration salts (ORS) such as electrolytes solution should be given orally as soon as possible. If calf is lethargic, intravenous injection of Ringer's solution or Normal saline (Nacl) should be given with the help of

veterinary doctors.

(3) Treatment for Infectious diarrhea with fever

Antibiotic or anthelmintic can be used to suppress infectious diarrhea.

(4) Appropriate nursing-care protocol

1) Separate a sick calf from a herd of healthy calves

2) Keep the calf on well dried place.

3) Disinfect the floor, rope, enclosure fence, feeding utensils etc. thoroughly

In case a calf become sick due to diarrhea, diagnose its level referring to the table below.

There are three categories of diarrhea score 1, score 2 and score 3.

Score 3 form is too soft to form its shape but its condition is better than score 2 and it splashes on solid floor when a calf defecates.

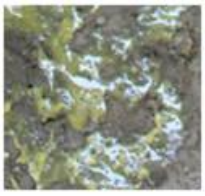
Score 2 is loose and soup form of stool. The stool does not splash on the solid floor because it is liquid form.

Score 1 is bloody stool. Black in color and blood is mixed. There is a possibility that a calf is infected with coccidiosis.

Each score is categorized into 2 conditions. Check the condition of a calf every time, if you find diarrhea than provide treatment with most appropriate manner. If the condition of calf gets worse quickly then immediate treatment is necessary. Medicine for stomach and intestinal disorder, antidiarrheal, oral replacement fluid “ORS” and antibiotic should be always kept available.

Once determined, treatment will continue at least 3 days.

Table 4-7 Diarrhea score of a calf

			Treatment by farmer	Treatment by veterinarian
Score 3 	**Light diarrhea** Stool is too soft to form its shape. When animals defecate, stool splashes.	Calf is standing. Calf drinks milk but slowly or does not drink.	ORS Medicine for stomach and intestinal disorder: 2 times	×
		Calf doesn't stand up. Calf doesn't drink milk.	ORS Antidiarrheal (Scorex oral suspension) : 2 times a day	
Score 2 	**The terrible diarrhea** Very loose, soup form of dung.	Calf is standing. Calf drinks milk but slowly or does not drink.		It is better intravenous injection 2 liter of physiological saline solution containing sulfa drug by veterinarian
		Calf doesn't stand up. Calf doesn't drink milk.	ORS Injection Sulfa drug by intramuscular injection	
Score 1 	**Bloody stool** Sometimes blood is mixed with stool	Calf is standing. Calf drinks milk but slowly or does not drink.		It is better intravenous injection 2 liter of physiological saline solution containing sulfa drug by veterinarian + Anti-coccidium
		Calf doesn't stand up. Calf doesn't drink milk.		

4.12 Pneumonia in calves

Pneumonia is a major problem in calves it may be due to bacterial and viral infection.

Symptoms

- Dull and depressed
- High temperature up to 105ºF
- Raised breathing due to infected lungs
- Nasal discharge
- Dry muzzle
- Coughing
- Reduced food intake

Treatment

Antibiotics, anti-inflammatory and anthelmintic drugs can be prescribed for treatment.

Chapter 5 Reproduction

5.1 Improving reproduction

Reproduction can be improved in following 2 ways;

1) To achieve early age at first calving (for heifer); Improve feeding management so as to improve growth of heifers and to have first mating and conception in early age. When body weight of heifer reaches to 300kg (or 161cm heart girth), is appropriate time for mating can be taken place.
2) To achieve early conception after parturition (for parous cow); Shorten calving interval.

5.1.1 To achieve earlyage at first calving (for heifer)

Cattle/buffaloes can produce milk only after she conceives and delivers a calf. Cattle in Sindh Province conceives for first time at around 2.5 to 3 years old and have first calving at the age of 3.5 to 4 years. For a heifer to get conceived in its early age, it needs to grow well and reach at early maturity. Daily weight gain of calves and heifers in rural Sindh is 0.25 kg on average, which is low and main cause of late maturity and age at first mating. It is important to increase daily weight gain up to 0.5kg by providing plenty of good quality hay (of those plenty of leaves) during suckling and after weaning up to 8 months of age, followed by provision of plenty of good quality of roughage (of those plenty of leaves) after 8 months of age. The heifer can reach to optimum body weight 300 Kg at the age of 1 and half years. This is appropriate body weight for first mating.

[Example of buffalo]

- The present buffalo growth in rural Sindh: 1,064 days (about 3 years old) are needed to reach appropriate body weight for first mating
  Birth weight of 34kg + (1,064 days x 0.25 kg) = 300kg
- In case of improved growth rate (0.5Kg/day): The heifer at the age of 532 days (about 1.5 years old) shall reach appropriate body weight for first mating
  Birth weight of 34 kg + (532 days x 0.5kg) =300kg

(1) Body weight

It is not easy to measure body weight of buffaloes at farm, because it is required a retainer and a load-bar. Therefore, the Project developed the table for body weight estimation by the length of heart girth of Kundhi buffalo and its mix breed which is the most common breed for livestock rearing in Sindh province. It is easy to estimate body weight by measurement of heart girth using measuring tape with few errors from actual body weight. The table for body weight estimation is covered a range of heart girth from minimum 65cm to maximum 255cm. It is equivalent from 40kg to 1,030kg in body weight.

(2) How to measure correct heart girth

1) Let a buffalo stand flat area and incline its head upward.
2) Right body position for measurement is shown in Photo 5-1. It is just next to shoulder blade.
3) Wrap the measuring tape around right position and fasten it with room for your two fingers. This is the standard.

4) In case of an emaciated buffalo, fasten the measuring tape slightly tight. In case of a fatty buffalo, slacken the measuring tape slightly.

Photo 5-1 Right position is shown in a white line to measure heart girth

Table5-1 Quick chart for body weight and heart girth

Heart Girth	Eestimated weight	Heart Girth	Eestimated weight	Heart Girth	Eestimated weight	Heart Girth	Eestimated weight	Heart Girth	Eestimated weight	Heart Girth	Eestimated weight	Heart Girth	Eestimated weight	Heart Girth	Eestimated weight
65	40	91	62	117	120	143	214	169	344	195	510	221	712	247	950
66	40	92	63	118	123	144	218	170	350	196	517	222	720	248	960
67	40	93	65	119	126	145	223	171	355	197	524	223	729	249	969
68	40	94	67	120	129	146	227	172	361	198	531	224	737	**250**	979
69	41	95	68	121	132	147	232	173	367	199	539	225	746	251	989
70	41	96	70	122	135	148	236	174	373	**200**	546	226	755	252	1000
71	42	97	72	123	138	149	241	175	379	201	553	227	763	253	1010
72	42	98	74	124	142	**150**	245	176	385	202	561	228	772	254	1020
73	43	99	76	125	145	151	250	177	391	203	568	229	781	255	1030
74	43	**100**	78	126	148	152	255	178	397	204	576	230	790		
75	44	101	80	127	152	153	260	179	403	205	583	231	799		
76	45	102	82	128	155	154	264	180	410	206	591	232	808		
77	45	103	84	129	159	155	269	181	416	207	599	233	817		
78	46	104	86	130	162	156	274	182	422	208	606	234	826		
79	47	105	89	131	166	157	279	183	429	209	614	235	835		
80	48	106	91	132	170	158	284	184	435	210	622	236	845		
81	49	107	93	133	173	159	290	185	442	211	630	237	854		
82	50	108	96	134	177	160	295	186	448	212	638	238	863		
83	51	109	98	135	181	161	300	187	455	213	646	239	873		
84	52	110	101	136	185	162	305	188	462	214	654	240	882		
85	53	111	103	137	189	163	311	189	468	215	662	241	892		
86	55	112	106	138	193	164	316	190	475	216	670	242	901		
87	56	113	109	139	197	165	322	191	482	217	678	243	911		
88	57	114	111	140	201	166	327	192	489	218	687	244	920		
89	59	115	114	141	205	167	333	193	496	219	695	245	930		
90	60	116	117	142	210	168	338	194	503	220	703	246	940		

5.1.2 To achieve early conception after parturition (for parous cattle/buffalo)

(1) Early reproductive diagnosis after parturition

Cattle requires 30 to 45 days to recover their uterus after parturition. To mate your cattle earlier after

parturition to get it conceived again, your proactive action will be needed. Call a veterinary doctor to have early reproductive diagnosis of cattle at 30 days after its parturition. Necessary treatment of problem cows by a veterinarian doctor at that point of time will allow cattle to come in heat and get conceived again in early stage. Short delivery interval means more number of parturition in their life time. It also means that cow produce more milk in her life time and income of the farmer increased.

(2) Shortening calving interval

1) Cattle

It might be a little bit difficult target to get one calving per year. Earlier a cow get conceived, shorten the calving interval. Asa result, total milk production of a cow in her lifetime will increase.

One year is comprised of 365 days. Pregnancy period of a cow is 285 days on average. Deducting 285 days from a year equals to 80 days. Supposing recovering period of uterus as 30 days on average[1], 50 days (80 days minus 30 days) will be left for next conception. If a cow comes in heat again during these 50 days of period and get conceived, 'one delivery per year' can be achieved. Heat cycle of a cow is 21 days on average. You will have 2 chances of your cow becomes in heat and get conceived during this period.

Example: Parturition interval : Case of Cattle

1 year (365 days)	
Pregnancy period 285days ±10 days	80 days

Figure 5-1 Pregnancy period of a cow

2) Buffalo

Pregnancy period of buffalo is longer than cattle, which make it more difficult to get one calving per year as compared with cattle. Earlier a buffalo get conceived, shorter calving interval becomes. Asa result, total milk production of a buffalo in her lifetime will increase.

One year is comprised of 365 days. Pregnancy period of a buffalo is 310 days on average, which is 25 days longer than cattle. Deducting 310 days from a year equals to 55 days. Supposing recovering period of uterus as 30 days, 25 days (55 days minus 30 days) will be left for next conception. If a buffalo comes in heat again during this 25 days of period and get conceived, 'one delivery per year' can be achieved, which seems difficult for a case of buffalo. Heat cycle of a buffalo is 21 days on average. If mother buffalo comes in heat and get conceived during this period, you can achieve the target. It is, however, difficult for a case of buffalo so the ideal delivery interval would be a little bit longer than those of a cow.

Example: Parturition interval : Case of Buffalo

1 year (365 days)	
Pregnancy period 310days ±10 days	55 days

Figure 5-2 Pregnancy period of a buffalo

[1] 20 to 70 days are required to recover uterus after calving.

5.2 Detecting heat of Kundhi buffalo

Currently there is no detailed data of heat phenomenon of Kundhi buffalo available. Data of Nili Ravi buffalo breed, therefore, is used for explanation below. Comparing with cattle, it seems quite difficult to detect heat sign of buffalo.

5.2.1 Heat

Buffalo comes in heat mostly in the night, i.e. 85% heat is appeared in the night time. It is, therefore, difficult for farmers to detect their heat sign.

	Time	%	
The night	18:00 - 22:00	19	85
	22:00 - 02:00	40	
	02:00 - 06:00	26	
The day	06:00 - 12:00	4	15
	12:00 - 18:00	11	

Table 5-2 Heat sign of Nili Ravi buffalo breed detected by time

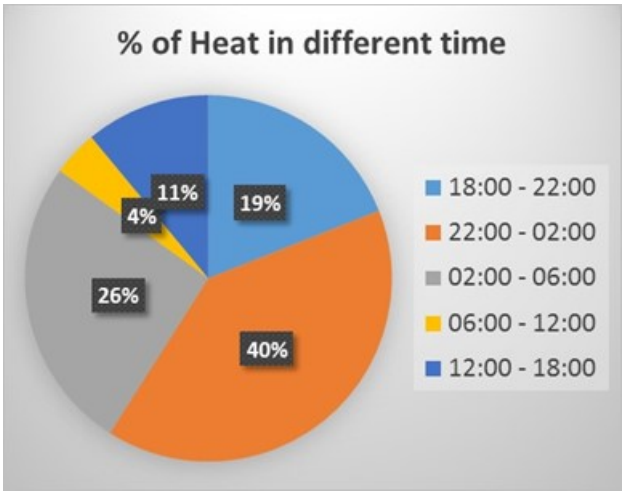


Figure 5-3 Heat sign of Nili Ravi buffalo breed detected by time

Source: National Agricultural Research Center

Besides, characteristics of buffaloes' heat sign are different from cattle, which are explained below;

- Mounting with both female animal, i.e. courtship display, are rarely seen. (buffalo mounted by fellow buffalo is in heat).
- Mucus from external genitalia is not strongly correlated with heat sign.
- Only around 30% of buffalo bellowing at the time of heat.
- Heat period is short.
- Silent heat (heat without apparent sign) frequently occurs.

Heat can also be detected from phenomenon such as decrease of milk production, becoming fidget, buffalo does not care even their hind legs are touched.

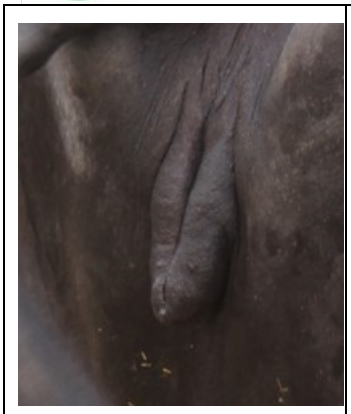
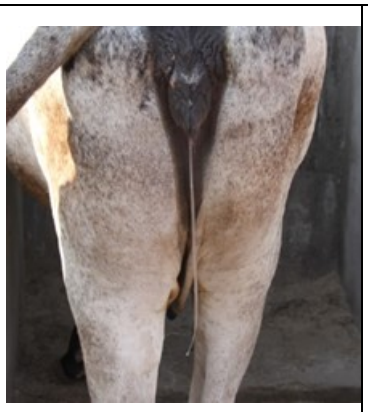
	

Photo 5-2 Swelling of external labium	Photo 5-3 Mucus from external labium	Photo 5-4 Natural mating

5.2.2 Frequency of heat detection observation for buffalo

Normally frequency of observation for heat detection can be set as 3 times in a day, namely, morning, midday and evening. At least 10 minutes per time observation are recommended. Observation of your herd in the paddock or grazing field allows to check mounting behavior of buffalo so that detection rates can be increased. As mentioned above, for the case of buffaloes, their heat occurs mostly in the night, i.e. 19% during 18:00 to 22:00 and 40% during 22:00 to 2:00. It is, therefore, recommended to observe one more time before you go to sleep in the night.

5.3 Reproductive record

Let's improve reproduction of your cattle together with veterinary doctors.
To improve reproduction of your cattle, record on reproductive activities of your cattle is essential step.
Let's look at the calendar below, learn how to record and do it!

Currently farmers in Sindh province do not take any measures against their cattle which have been nonpregnant for a long time. Proper reproductive diagnosis and treatment is almost non-existent in rural areas. There are few numbers of skilled veterinary doctors specialized in reproductive health as well.
To improve reproduction of your cattle, records of reproductive activities of your cattle is necessary.
This record will help for proper diagnosis and treatment by veterinary doctors.
Let's start recording.

As a first step, you enter the name of female cattle/buffalo.
Any calendar is used for recording. Following information should be noted down on day each activity is taken place.

1) Record of Parturition: Name of mother
2) Record of Heat: Name of female cattle/buffalo comes in heat
3) Record of Mating: Name of female cattle/buffalo mating, type of mating, i.e. either natural mating (NM) or artificial insemination (AI), Name of bull
4) Other information: Abortion, Sold out, Dead and so on.

Table 5-3 Sample of reproduction record (calendar type)

Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.
Note: NM: Natural mating A I : Artificial Insemination				1	2	3
4	5 Basir, Heat	6 Basir, NM	7	8	9	10 No.211, Died
11	12	13	14	15 Badin, Heat	16	17
18	19 Tand, Abortion	20	21	22 Memon, Delivery	23	24
25	26 Hyde, AI	27	28	29 Tand, Sold	30	31

Chapter 6 Animal Health

6.1 Promotion of disinfection practice

Syringes, needles and other apparatus for medical care and treatment should be sterilized by boiling. Sterilized syringes, needles and other apparatus should be kept in the disinfected metal box or glass bottle and do not mix with used syringes or needles.

Dettol which is easily available in the local market can be used for disinfection instead of alcohol. Spray will be used for disinfection of nervous cattle so that technician can quickly disinfect cattle before they run away.

Disinfection method is not practicing in Sindh province. Disinfection of syringes for vaccination, treatment and apparatus for injecting medicines to uterus were not practiced. Hands are also not disinfected when technician insert their hands in vagina at the time of delivery. Main hindering factors of disinfection practices are as follows; 1) Purchase of alcohol for disinfection needs special permission (To prevent from drinking alcohol accidently), 2) Difficulty of animal management at the time of injection (Animals are nervous and injection has to be given immediately, so there is no chance of disinfection practice), and 3) Shortage of needles and syringes. Considering all hindering factors mentioned above, following promotion of disinfection practice will be carried out to prevent cattle from infection of communicable diseases due to unhygienic treatment.

Photo 6-1 Spray for disinfection

Photo 6-2 Schimmelbusch (boiling-sterilizer) and metal box for disinfected syringes and needles

6.2Prioritizing prevention

Focus on prevention of diseases.

Once young cattle/ become sick, their growth will be suspended. If milking cow becomes sick, their milk production will be decreased. It takes some time to recover their milk production. In some cases, milk production will not be recovered up to the previous yield. This cause huge economic loss of farm.

Prevention is less costly than treatment. Prevention is, therefore, most important in animal health.

Basis for prevention of disease is vaccination for infectious disease and regular deworming for endo and ecto parasite. When cattle become weak, resistance against disease will be decreased and become easy to get sick. Maintaining healthy body through proper daily feeding management is also very important to prevent cattle/buffalo from disease.

6.2.1 Foot and mouth disease (FMD)

What is FMD?

Initially, blisters grow in a mouth, nose, hoof and udder. Those blisters become smashed and ulcer forms. Ulcer in the mouth decrease appetite. Ulcer on hoofs causes lameness. Main symptoms are visible on mouth and hoof, thus it is called as 'foot and mouth disease'. FMD is not fatal disease but once body weight and milk production of those cattle/buffaloes are dropped, it takes long time to recovery. Loss for 1 head of FMD infected buffalo might be little, but it results in huge amount of economic loss as whole region or a country.

* Disinfection: Appropriate disinfectant for FMD are.caustic soda, sodium carbonate, acetic acid. It has resistance against acid, alkaline, ether and sunshine. (Potassium per magnate, tinct: Iodine, glycerine, gention violet).
* Transmission: Splash from breath of FMD infected animal transmit FMD virus to other animals. Wind also spread virus as far as 50km distance.

6.2.2 Hemorrhagic Septicemia HS

HS is bacterial disease and acute pasteurellosis. Most symptomsare acute and infected animals die within 8 to 24 hours after symptom appears. HS vaccine can keep in room temperature and less costly. Vaccinate HS vaccine every year at specified time to prevent from it.

HS disease outbreak is common among cattle and buffaloes. Buffaloes are more susceptible than cows to get infection of HS disease. HS is fatal disease which causes death within a very short period, it makes difficult to detect the initial symptoms. Initial symptoms are high fever, edema on neck or breast, salivation and nasal discharge. HS bacteria is transmitted through direct or indirect contact with nasal flow or saliva.

6.2.3 Endoparasite

Perform deworming according to annual deworming calendar (attached with this text).
Oral administration of deworming is less costly and effective.

Deworming of calves

Newly born calves have less number of parasites, but number of parasite in their body gradually increases while they grow up. Calves grown up with good nutrients increase their resistance by the time they reach 6 months of age. The number of parasite in their body, then, gradually decreased after 6 months of age. On the other hand, underfed and weak calves increase the number of parasite in their body very quickly, which cause frequent complication of diarrhea and pneumonia. Consequently, they lose body strength. It is vicious circle.

Most important thing is to feed proper nutrients to calves. At the same time, deworming of calves during their early month of age is equally important. To prevent from parasite being transmitted from wet floor, keep the calves always on dry floor.

		
Photo 6-3 Deworming in the iron race	Photo 6-4 Deworming in a paddock	Photo6-5 Deworming in a field

6.2.4 Blood protozoan disease

Blood protozoan include Anaplasma, Babesia, Theileria and so on. These protozoans causes high fever during outbreak. When your cattle show high fever, call veterinary doctor immediately. Let veterinary doctor investigate and identify a type of disease and give proper treatment to cattle immediately.

Blood protozoan diseases are transmitted through ectoparasite such as tick, horsefly, and stable fly. Spray insecticides or repellents for their eradication.

6.2.5 Prevention and treatment of mastitis

Please refer to the comic ‘Let’s learn about mastitis’.

HEALTH CALENDAR TO PREVENT THE CALVES AGAINST CONTAGIOUS AND PARASITIC DISEASES

Vaccination

Category and Species	Jan.	Feb.	March	Apr.	May	Jun	Jul	Aug	Sep	Oct	Nov.	Dec.
						Rainy Seasons						
Adult & Young of Cattle and Buffalo				**B.Q. Vaccine** once in a year		**H.S.Vaccine** twice in a year				**F.M.D.Vaccine** twice in a year		**H.S.Vaccine** twice in a yea

Birth →	1st Month				2nd Month				3rd Month				4th Month				5th Month				6th Month				8 Month				9 Month				10 Month			
Week	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Calves of Cattle and Buffalo							**H.S.Vaccine** 1st dose 6th weeks , than twice in a year as per calendar																															
									F.M.D.Vaccine 1st dose 1st week of 3rd months																													
													Booster dose after 1 month from 1st dose 2nd dose after 6th month from1st dose																								
																					B.Q. Vaccine 1st dose 6th months and above, than follow annually calendar															

Deworming

Category and Species	Jan.	Feb.	March	Apr.	May	Jun	Jul	Aug	Sep	Oct	Nov.	Dec.
Adult & Young of Cattle and Buffalo		1) Drench				2 times drenching might be enough. Will be examined again by seeing the result. 2) Drench				3) Drench		
		1)Ivermectine (2 weeks after drench)				2)Ivermectine (2 weeks after drench)				3)Ivermectine (2 weeks after drenc		

Month	1st Month				2nd Month				3rd Month				4th Month				5th Month				6th Month				8 Month				9 Month				10 Month			
Week	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Calves of Cattle and Buffalo	1st Dose of **Drench** shuould be given at the age of 30 days, than follow the calendar						**Ivermectin** should be applied after 10 days of drench than follow the calendar																															

HS:Hemorrhagic Septicemia FMD : Food and Mouth Disease BQ: Black Quarter

Figure6-1 Animal Health Calendar

Reference

Japan International Cooperation Agency (January 2016), 2.1.2. Activity Output 1 Page14-42, 2.2 Outcome of activities in *Project Progress Report (Second Year) of the Project on Sustainable Livestock Development for Rural Sindh "PSLD"*, Tokyo, JICA, pp 49-63

Japan International Cooperation Agency (February 2017), Chapter 3 Preparation of Third Country Training (Thailand) in *Project Progress Report (Third Year) of the Project on Sustainable Livestock Development for Rural Sindh "PSLD"*, Tokyo, JICA, pp19

Japan International Cooperation Agency (February 2017), Chapter 3 Output 1&2 in *Project Progress Report (Third Year) of the Project on Sustainable Livestock Development for Rural Sindh "PSLD"*, Tokyo, JICA, pp 21-71

Japan International Cooperation Agency (February 2018), Chapter 3 in P*roject Progress Report (Forth Year) of the Project on Sustainable Livestock Development for Rural Sindh "PSLD"*, Tokyo, JICA, pp 11-70

Japan International Cooperation Agency (February 2018), Attachment, in P*roject Progress Report (Forth Year) of the Project on Sustainable Livestock Development for Rural Sindh "PSLD"*, Tokyo, JICA, pp A50-A91

Japan Livestock Technology Association (March 2003), Cow Foot Care Manual, Tokyo, Japan Livestock Technology Association

Tominaga, H (2001), Manual de intorduccion al pastreo, Projecto de Mejoramiento de ganado Bovino de Carne, Rsanta Cruz, Bolivia, JICA-UAGRM, pp 9-10

Tomigana, H (2012), Cartoon Mastitis, Pojecto de Mejoramiento de la Productividad Ganaderr para los Productores de Pequeno y Mediana Escal en Nicaragua "PROGANIC II", Managua, Nicaragua, JICA-MAGFOR-UNA-IDR

سنڌ جي ٻهراڙي لاءِ چوپائي مال جي پائيدار ترقي وارو منصوبو

ڊيري فارمنگ لاءِ مناسب فني مهارت تي ڪتابچو

توسيعي ڪارڪن جي لاءِ

PSLD

جنوري 2019

January 2019

Produced by The Project on Sustainable Livestock Development for Rural Sindh (PSLD)

Sponsored by Japan International Cooperation Agency (JICA)

Preface

Livestock is the largest sub-sector in agriculture of Pakistan, contributing 11.4 percent to overall GDP of the country. Livestock plays vital role in rural economy and livelihood of rural poor, so as in rural Sindh. It is a source of cash income, nutrition and sometimes only asset for the rural and marginalized people.

The Project on Sustainable Livestock Development for Rural Sindh (The Project) is the 5 year technical cooperation project implemented in collaboration with the Livestock and Fisheries Department, Government of Sindh and Japan International Cooperation Agency (JICA), Government of Japan, aiming for creating foundations of sustainable livestock sector development in Sindh province, which benefit small scale dairy farmers who comprises more than 80 percent of the sector. The Project was initiated in February 2014 and implemented in 5 pilot districts, namely Matiari, Hyderabad, Tando Muhammad Khan, Tando Allahyar and Badin. The Project focused on development of appropriate technologies for dairy farming. Throughout five years of implementation, appropriate technologies were developed, piloted and verified for the use of small scale formers in Sindh province. Along with the appropriate technologies, useful basic technologies for livestock professional technicians were developed. The technologies range over 8 areas, namely, farm management, marketing, feeding management, fodder, animal health, animal reproduction and genetic improvement, Livestock assets. The Project worked on effective utilization of livestock resources, i.e. calves and dry buffaloes in the commercial cattle colony as well. Method for salvation of calves and dry buffaloes were verified.

Technologies developed by the Project are compiled as textbooks, guidelines and booklets for wider application and dissemination to professional technicians, and ultimately to farmers. The Livestock and Fishery Department hope that these series of publications will widely be used by livestock professional technicians both public and private and dairy farmers in Sindh province for uplifting their livelihood.

Director General / Project Coordinator
The Livestock and Fisheries Department
Government of Sindh

Foreword

The Project on Sustainable Livestock Development for Rural Sindh has been implemented in Southern parts of Sindh Province, Pakistan in collaboration with Livestock and Fisheries Department, Government of Sindh and Japan International Cooperation Agency (JICA). The Project was supported by the team of Japanese experts headed by Mr. Hiroshi Okabe.

The long-term objectives of the Project are improvement of productivity of milk and increase of income of small scale dairy farmers. The number of cattle/buffalo reared by one small scale dairy farm is small, generally within 5 heads, which includes both adult cattle/buffalo, heifers and calves. Most of small scale dairy farmers do not possess their own land. Under such conditions it is difficult to run sound dairy farming. Towards the long-term objectives, 50 appropriate technologies have been verified by the Project. The technologies are ranked A, B and C. The number of each technology is 20, 22 and 8, respectively.

The definition of each rank is as follows:

Rank A: Technology ranked as 'A' is defined as highly effective and easy to apply at farms.
Rank B: Technology ranked as 'B' is defined as highly effective but not easy to apply at farms.
Rank C: Technology ranked as 'C' is defined as middle level effective and not easy to give guidance and apply at farms during the project period.

Livestock technicians are expected to provide technical guidance on rank A technologies to farmers as an initial step. Rank B and C technologies are also essential for sound dairy farming management. Livestock technicians therefore are encouraged to continue technical guidance on those technologies.
Besides, 32 useful technologies which are effective for increasing milk production in the long term have been identified by the Project. The useful technologies include reproductive disorder diagnosis and treatment, milk test and pedigree registration for genetic improvement, animal sheds and so on.
In this textbook, 50 appropriate technologies and 9 useful technologies are explained.

The Project activities have been carried out by 9 Pakistani Veterinary Officers of Sindh Livestock and Fisheries Department as the counterparts of the Project along with 13 Japanese experts and a Bolivian expert on Andrology. This textbook was compiled based on these Project activities. Logistic support from the project national staff were indispensable for compilation of the textbook as well.
We would like to take this opportunity to thank all those involved in development of this textbook. We hope this textbook is useful for technicians who shall give technical guidance to small scale dairy farmers in Sindh province.

Editor in Charge Dr. Hideo Tominaga
Along with Support of the Technical Counterparts of Sindh Livestock and Fisheries Department
and the Japanese Expert Team

Pakistani Counterparts

Dr. Ghullam Muhammad Jiskani, Specialist in Farm management
Dr. Safdar Ali Fazlani, Specialist in Feeding Management
Dr. Muhammad Arif Khan, Specialist in Fodder
Dr. Akthar Ali Shahani, Specialist in Animal Reproduction
Dr. Zulfiqar Ali Pathan, Specialist in Animal Health
Dr. Muhammad Mubarak Jatoi, Specialist in Genetic Improvement
Dr. Iqtadar Ali Memon, Specialist in Marketing
Dr. Naeem Siddique Ansari, Specialist in Animal Assets
Dr. Rukhsana Vighio, Specialist in in Training

Pakistani National Staff

Dr. Ghulam Sarwar Shaikh, General Coordinator
Dr. Rasool Bux Soomro, Technical Coordinator
Ms. Zahida Soomro, Technical Assistant

Japanese experts

Dr. Hideo Tominaga, Expert on Livestock Technology Development
Dr. Teruo Sugiwaka, Expert on Feeding Management
Mr. Teruo Kawamura, Expert on Feeding Management
Dr. Shinsuke Kobayashi, Expert on Fodder
Dr. Kazuhiro Ono, Expert on Animal Reproduction
Dr. Takeshi Abe, Expert on Animal Reproduction
Dr. Shigehisa Tsumagari, Expert on Animal Reproduction
Dr. Yoshitaka Nagamine, Expert on Genetic Improvement
Mr. Yoshio Chiba, Expert on Genetic Improvement
Ms. Fumiko Ikegaya, Expert on Marketing
Dr. Yukio Ikeda, Expert on Farm Management
Mr. Naofumi Tsukidate, Expert on Hoof Cutting
Ms. Noriko Hara, Expert on Livestock Technology Development
Ms. Mika Kawamoto, Expert on Livestock Extension/Gender

Bolivian Expert (3rd county Expert)

Dr. Jose Nazario Videz, Expert on Andrology

Extension Team of the Project

Dr. Anisa Soomro, Extension Team Leader, Gender Specialist
Dr. Farzana Sarki, Social Mobilizer
Dr. Kabeer Ali Kalhoro, Master Trainer Badin
Dr. Muhammad Mubeen Soomro, Master Trainer Hyderabad
Dr. Farooque Ahmed Pathan, Master Trainer Matiari
Dr. Iqbal Ahmed Memon, Master Trainer Tando Muhammad Khan
Dr. Uzma Abbas Chattah, Extension Worker, Badin
Dr. Bibi Ghulam Zuhra Shah, Extension Worker Hyderabad
Dr. Raheela Parveen, Extension Worker Hyderabad
Dr. Reema Tunio, Extension Worker Matiari
Dr. Musarat Kumbhar, Extension Worker Matiari
Dr. Sonia Mirza, Extension Worker Tando Allahyar
Dr. Irum Laghari, Extension Worker Tando Allahyar
Dr. Sheeren Memon, Extension Worker Tando Muhammad Khan
Mr. Muhammad Sharif, Extension Worker Badin
Mr. Zahid Ali Boohar, Extension Worker Badin
Mr. Arif Ali Junejo, Extension Worker Hyderabad
Mr. Ahsan Khan, Extension Worker Hyderabad
Mr. Ashfaque Ali Kaka, Extension Worker Matiari
Mr. Abdul Manan Rahu, Extension Worker Matiari
Mr. Abdul Ghani, Extension Worker Tando Allahyar
Mr. Barkat Ali Shaikh, Extension Worker Tando Muhammad Khan
Mr. Meva Ram, Extension Worker Tando Muhammad Khan

List of Appropriate technology

Technical field	No		Appropriate technology	Rank
1. Farm Management	1	1	Sound dairy farm management	C
	2	2	Reduce Labor Cost	B
	3	3	Reduce Expenditure of Dairy Farm	C
2. Marketing	1	4	Deliver sizable milk regularly	C
	2	5	Trial to Introduced the milk company to some of P/F	C
	3	6	Do not adulterate milk with water	A
3. Feeding Management	1	7	To supply sufficient water	A
	2	8	Clean water	A
	3	9	Improving Tie Method	A
	4	10	Shade	B
	5	11	Good Ventilation	A
	6	12	Keeping dry floor	A
	7	13	Right calf management after its birth	A
	8	14	Right milking colostrum	A
	9	15	Health management of suckling calf	B
	10	16	Prevention measurement against heat for calf	A
	11	17	Improvement of roof and floor at place milking	B
	12	18	Management cow at time of parturition	A
	13	19	Appropriate feeding cow after parturition	B
	14	20	Management dry cow	B
	15	21	Appropriate feeding cow before parturition	B
	16	22	Bathing	A
	17	23	Shower	A
	18	24	Hoof- cutting	A
	19	25	BCS for milking animal	A
	20	26	Degree of nutrition for calves	A
	21	27	Using Retainer	C
	22	28	Drinking sufficient water (Freedom drinking water)	B
	23	29	Correct Milking Techniques	B
	24	30	Co Management of Livestock	C
4. Fodder	1	31	Trail Formula Feed Plan	C
	2	32	Feed a good quality roughage	B
	3	33	Clean up trough of Feed	A
	4	34	Making hay for calve	A
	5	35	Concentrate for calves	B
5. Reproduction	1	36	Recording of reproduction	B

Technical field	No		Appropriate technology	Rank
	2	37	Detection heat	A
	3	38	Diagnostic of reproduction	B
6. Animal Health	1	39	Management diarrhea for calf	B
	2	40	Prevention FMD	B
	3	41	Prevention HS	B
	4	42	De-worming & Cleaning strictly shed /paddock	B
	5	43	De-worming of appropriate age of calves	B
	6	44	Rotation of chemicals with different component	B
	7	45	Prevention of Ecto Parasite	B
	8	46	Blood parasite	B
	9	47	Prevention & treatment of Mastitis	C
7. Genetic Improvement	1	48	Try to identify good buffalo bull	A
	2	49	Awareness of Genetic Improvement	A
	3	50	Using guaranty bull	B

List of Basic Technology

Full-scale trial : ○Semi-trial : △Not implemented : X

Technical field	No		Basic technology	Degree of Application during the project period
1. Farm Management	1	1	Classification dairy farmers	○
	2	2	Analysis Dairy Economy	○
	3	3	Recording on farm management information	○
2. Marketing	1	4	Collection the marketing information of milk and livestock animal	△
3. Feeding Management	1	5	To improve quality water	X
	2	6	Grazing	X
	3	7	Milking Shed	○
	4	8	Simple Shed	○
	5	9	Paddock	○
	6	10	Cold Counter Measure	△
	7	11	Feeding Trough	○
	8	12	Water Trough	○
4. Fodder	1	13	Cutting Roughages	△
	2	14	Roughages production	○

Technical field	No		Basic technology	Degree of Application during the project period
	3	15	Analysis of Feed	○
	4	16	Analysis of soil	△
	5	17	Provide salt to Cattle/Buffalo	△
5. Reproduction	1	18	Abortion	△
	2	19	Retention of Placenta	X
	3	20	Prolapse	X
	4	21	Reproductive disorder	○
	5	22	Andrology	○
	6	23	Physiological survey for buffalo	○
	7	24	Artificial Insemination	X
6. Animal Health	1	25	Hygienic treatment technology	○
	2	26	Brucellosis	○
	3	27	Tuberculosis	○
7. Genetic Improvement	1	28	Milk test	○
	2	29	Pedigree registration	○
8. Livestock Assets	1	30	Guideline of Monitoring calves system	○
	2	31	Guideline of Calves distribution system	○
	3	32	Guideline of Recycling of dry buffalo system	○

(Remarks)

The unit, kilo gram (KG) is used for milk yield in this textbook.

The weight of 1,000 ml (1 liter) of milk at a temperature of 15 ° C is calculated as 1,030 g (1.3 kg).

Calculating formula:

1,000ml x 1.03 (specific gravity of milk) = 1,030g

This textbook is using unit of milk production in kilogram except field of marketing.

باب پهريون

بنيادي طور تي وٿاڻ جي سارسنيال بهتر بنائڻ

اچو ته ڏيري فارم جي بهتر سارسنيال ڪري ڪير جي پيداوار وڌايون ته جيئن اسان جي رهڻ سهڻ ۽ آمدني ۾ واڌارو ڪري سگهون اهو آسان نه آهي پر توهان جي ڪوشش سان احساس ڏياري سگهجي ٿو.

1.1- تجرباتي طور تي ڪير جي پيداوار وڌائڻ

پهريان ته اهو سمجهڻ جي ڪوشش ڪجي ته ڪهڙي قسم جون مهارتون ڪير جي پيداوار وڌائڻ جي لاءِ ڪيئن جڙيل آهن، ڪير جي پيداوار وڌائڻ گهڻن عنصرن سان تعلق رکي ٿي. هڪ ڪان وڌيڪ مهارتن جي استعمال سان ڪير جي وڌيڪ پيداوار حاصل ڪري سگهجي ٿي.

منصوبي جا مقصد

ڪير جي پيداوار وڌائڻ

سيني شعبن جي گڏيل ڪوشش سان ڪير جي وڌيڪ پيداوار حاصل ڪري سگهجي ٿي. جيئن هيٺ ڏنل تصوير ۾ ڏيکاريل آهي جانورن جي ڪاڌ خوراڪ جي بهتر سارسنيال، جانورن جي بهتر صحت، جانورن جي توليدي نظام ۽ جانور جي نسلي صلاحيت وسيع پئماني تي ضرور بهتر نموني ڪير جي پيداوار وڌائي سگهي ٿي. ڪاڌ خوراڪ ۽ جانورن جي صحت ذريعي جيڪا گهٽ کان وقت ۾ بهتر پيداوار حاصل ڪري سگهجي ٿي اهڙي طريقي سان جانور جي توليدي ۽ نسلي (جينياتي) کي بهتر ڪرڻ لاءِ 4 کان 5 سال لڳندا.

قرن ۽ باکڙن مينهن جي ڪارآمد استعمال سان جانورن جي تعداد وڌائي سگهجي ٿي ۽ ڪير جي پيداوار پڻ وڌائي سگهجي ٿي. تنهنڪري ڪنهن به نتيجن کي ڏسڻ جي لاءِ ڀيهر ڏگهي عرصي جي ضرورت پوندي.

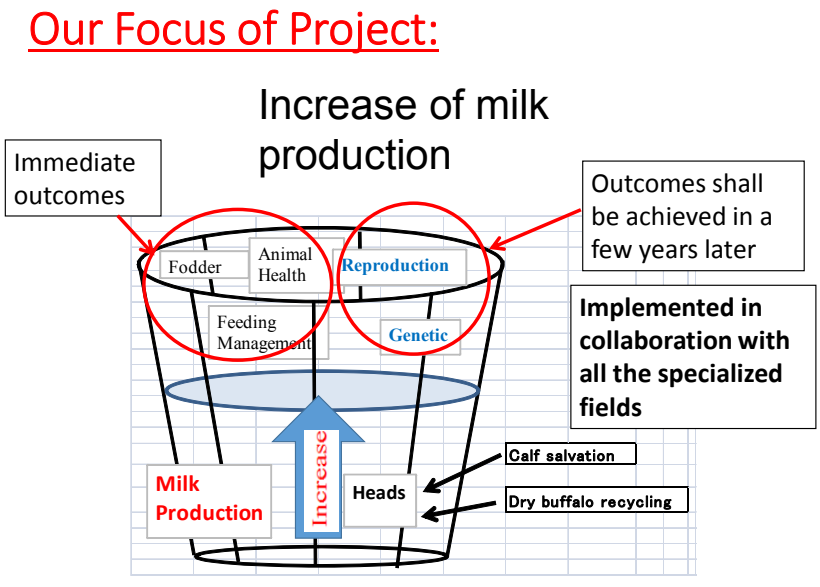


Figure 1-1 Increase of milk production by collective efforts of all fields

باب ٻيون

ڪامياب ۽ سڻي سارسنڀال جا اصول

2.1 ڊيري فارم جي پائيداري لاءِ ڪوششون ۽ آمدني وڌائڻ

ڊيري فارم جي پائيداري آساني سان حاصل نه ٿي ڪري سگهجي پر مرحليوار توهان ڊيري فارم جي سارسنڀال بهتر ڪرڻ جي ڪوشش ڪري سگهو ٿا.
سڻي ڊيري فارم جي سارسنڀال هيٺ ڏنل ڏاکن ۽ عنصرن تي ٻڌل آهي.

1. پيداوار جي واڌ
2. سالانه پيداوار کي برقرار رکڻ
3. گهٽ خرچ ڪرڻ

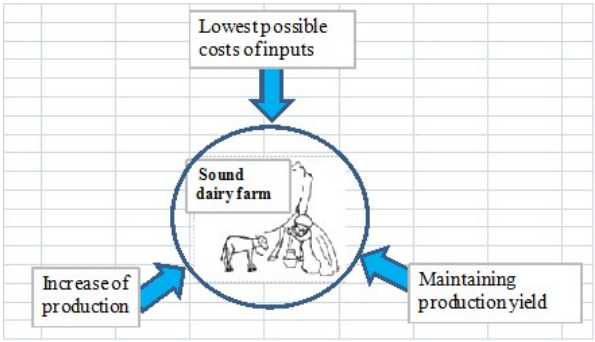


Figure 2-1 Conceptual diagram of sound dairy farm management

2.2 ڪير واري جانورن جي فارم کي بهتر ڪرڻ لاءِ هيٺين ڳالهين کي سمجهڻ ضروري آهي.

سڀ کان پهرين فارم جي موجود صورتحال کي ڏيان ۾ رکڻ گهرجي.

1) فارم جي اثاثن جي فهرست ناهيو ته جيئن سگهجي ته ڪيترا ۽ ڪهڙا اثاثا آهن.
2) پنهنجي جانورن جي پيداواري صلاحيتن کي سمجهڻ گهرجي.
3) مقرر يا طئي ڪريو ته پنهنجي فارم تي مناسب يا صحيح طريقي سان ڪيترا جانور سنياڻي سگهو ٿا. (ڳئون، مينهون) ۽ پنهنجي جانورن جي ڪير جو حدف پڻ طئي ڪيو.

2.2.1 ڪير واري فارم جا اثاثا

اثاثن ۾ زميني، جانور، موجود سهولتون ۽ موجود اوزار اچي وڃن ٿا.
انهن سڀني جي فهرست تيار ڪريو ۽ ان جو تسلي بخش استعمال کي يقيني بڻايو.
اوزار جهڙوڪ ڪُتر جي مشين، گڏهه گاڏي، جيڪا گاهه ۽ پاڻي جي ڪٽڻ لاءِ استعمال ٿئي ٿي. لوهه جي ڏاندري انهن سڀني شين لاءِ مناسب سرمايو گهرجي.



Photo 2-1 Livestock	Photo 2-2Facilities: Milking shed	Photo 2-3 Facilities: Paddock

	
Photo 2-4 Equipment: Chopper	Photo 2-5 Equipment: Carriage of cattle

2.2.2 زميني اثاثا

ڪاشت جي قابل زمين کي ڏسو.

a) جيڪڏهن زرعي زمين، ذرخيز زمين موجود آهي.
ڏسو ته توهان وٽ سيني ذرعي زمين يا هاري واري زمين آهي يا نه، بي ڪا مقاطي واري زمين آهي. ان لاءِ هيٺيون ڳالهيون ڏيان ۾ رکڻ گهرجن.

- ٽوٽل زرعي زمين ڪيتري آهي ۽ سائي چاري جي استعمال هيٺ ڪيتري آهي.
- سائي چاري جون ڪهڙيون جنسون پوکيل آهن ۽ هر جنس لاءِ ڪيتري زرعي زمين استعمال هيٺ آهي.

b) جيڪڏهن زرعي زمين موجود نه آهي.

- سڄي سال ۾ سائي گاهه جي موجودگي جو طريقہ ڪارجيئن ته مقدار ۽ سائي گاهه جي موجودگي جو وقت ڪلي چراهه گاهن جو طريقہ ڪار ۽ وقت (ممڪن آهي يا نه)
- هارپو ڪندڙ هاري لاءِ قدرتي سائي گاهه جو استعمال هاري واري زمين ۾ ۽ جانورن جي ڪلي چارڻ لاءِ ممڪن آهي خاص طور تي فصل جي ڀيلاڙي وقت ڪري سگهجي ٿو.
- چارن جو قسم ۽ انهن جو مقدار جيڪا ٻاهران خريد ڪيا وڃن.

2.2.3 جانورن جا اثاثا

(1) پنهنجي ڏڻ جي ڪير جي پيداوار صلاحيت کي بهتر ڪرڻ

پنهنجي جانورن جي ڏڻ جي پيداواري صلاحيت کي وڌائڻ/ بهتر ڪرڻ اهو ضروري آهي ته زياده/ وڌيڪ ڪير ڏيندڙ ڏڪين ۽ مينهن کي رکڻ/ پالڻ گهرجي ۽ گهٽ پيداواري صلاحيتون رکندڙ جانورن جي ڇانٽي/ نيڪالي ڪرڻ گهرجي. گهٽ پيداوار ڏيندڙ ڏڪين ۽ مينهن جي جاءِ تي يا به نسبت گهٽي پيداواري صلاحيت رکندڙ جانورن کي ترجيح ڏين گهرجي اهي جانور پنهنجي ڏڻ ۾ رکجن. گهٽ پيداواري صلاحيت رکندڙ ڏڪين ۽ مينهن کي وڌيڪ پيداواري بڻائڻ يا بهتر ڪرڻ. تمام سني ۽ بهتر صلاحيت واري سانهه جي استعمال ڪرڻ ذريعي ۽ گهٽ پيداواري صلاحيت وارين ڏڪين ۽ مينهن منجهان به سني/ بهتر صلاحيت وارا قر/ ٻچا

پيدا ڪري سگهجن ٿا.
توهان کي پهرين مرحلي ۾ اهو ضرور سکڻ گهرجي ته ڪيئن سڻي/ وڌيڪ پيداواري صلاحيت وارن ڍڳين، مينهن ۽ سانهن جي سڃاڻپ ڪرڻ گهرجي.
اڇو ته سکون، ڪيئن وڌيڪ صلاحيت رکندڙ ڍڳين، مينهن ۽ سانهن جي سڃاڻپ ڪريون.
1) وڌيڪ کير جي پيداواري صلاحيت رکندڙ ڍڳين ۽ مينهن جي ڪيئن سڃاڻپ ڪجي.
هر حالت ۾ ڳئون يا مينهن جو صحتمند هڻڻ گهرجي. اڇو ته سکون، وڌيڪ پيداواري صلاحيت رکندڙ ڍڳين يا مينهن جون نسلي خاصيتون ڪيئن معلوم ڪجن/ ڪرڻ گهرجن. سڻي پيداواري صلاحيت واري ڍڳي يا مينهن جي هڪ اها خوبي/ ڳڻ آهي ته ان جي اوهه جو مقدار وڌو هجي ۽ جيڪو اوهه سخت آهي ته ان جو اهو مقصد آهي ته اها ڍڳي/ مينهن سڻو کير ڏيندڙ نه آهي ٻلي ڪٽي انهن جو اوهه جو مقدار وڌو ڇو نه هجي، سڻو اوهه اهو آهي جيڪو لچڪدار، نرم ۽ ملائم هجي. سڻو اوهه اهو آهي جنهن ۾ لچڪ هجي. سڻي لچڪدار اوهه جي صورت ۾ ، ڏهائي ڪانپوءِ اوهه جي سختي گهٽجي ويندي آهي ۽ اوهه نرم ۽ ملائم ٿي ويندي آهي. ڳاٽيٽي جي علم جي استيٽڪس جي رڪارڊ جي بنياد مطابق جنهن مينهن/ ڍڳي جي کير جي نس/ رڳ ٽلهي ۽ اوهه وڏيل هوندو آهي يا هجي ته اهي ڍڳيون يا مينهون وڌيڪ کير جي پيداواري صلاحيتون رکن ٿيون.

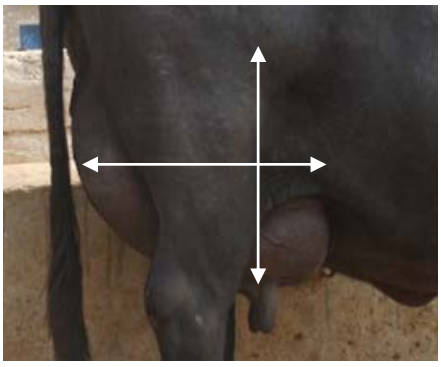


Photo2-6 Good volume udder (side view)

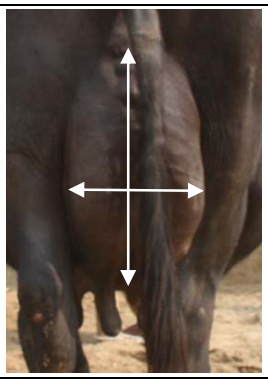


Photo 2-7 Good volume udder (rear view)

Photo 2-8 Thick and well-developed milk vein

* ڍڳين يا مينهن جي خريداري ڪرڻ وقت هي ڳالهيون ذهن ۾ رکڻ گهرجن.

مينهن/ ڍڳين جي خريداري ڪرڻ وقت هنن ڳالهين تي غور ويچار مٿي وضاحت ڪيل اوهه جي خاصيتن ۽ خوبين کان علاوه، مالدار ياڳئي/ واپاري کان ان جي مينهن/ ڍي جي ماءُ ۽ پيٽ جي کير جي پيداواري صلاحيتن جي جاڻ ونو.
ان کان پوءِ ان جانور جي افزائشي يا ٻچي ڏيڻ واري صلاحيتن جي جاڻ ٻه ونڻ گهرجي. جانور خريد ڪرڻ کان پهريائين جانورن جي ماهر ڊاڪٽر کان انهن ڍڳين/ مينهن جي ڏکڻ جي چڪاس ڪرايو ته جيئن اها خبر پوي ت اهي مينهن/ ڍڳيون ڏکيون آهن يا نه. جيڪڏهن ڍڳي/ مينهن ڏکي نه آهي ته ان صورت ۾ واپاري کان اها جاڻ ونو ته هي مينهن/ ڍڳي اڳ ڪڏهن ويامي هئي.

2) بهتر/ سڻي صلاحيت واري سانهن جي سڃاڻپ/ جانچ ڪيئن معلوم ڪجي.
گوشت وارن ڍڳين/ مينهن جي پيداواري صلاحيت وڌائڻ لاءِ واڌويجهه واري عرصي دوران سانهه جي پيداواري صلاحيتن جي سڃاڻپ جو اندازو انجي روزانو واڌويجهه ۽ ظاهري ڏيک مان نٿو ڪري سگهجي، جيستائين ان جي اولاد جي جانچ/ پرک (پروجيني ٽيسٽ) نه ڪئي وجي. سڻي صلاحيت واري سانهه جي سڃاڻپ لاءِ ته جيئن ايندڙ نسل ۾ سڻي کير جي پيداواري صلاحيتن کي يقيني بڻائي سگهجي. پروجيني ٽيسٽ جي ذريعي ان سانهه جي ذي جي کير جي پيداواري صلاحيت کي

معلوم/ جاچي سگهجي ٿو.
جيڪي سانهه پروجيني ٽيسٽ ذريعي چونڊيا ويندا آهن. انهن سانهن کي تصديق ٿيل چئبو آهي. جيڪڏهن توهان هٿرادو نسل ڪشي جي خواهش رکو ٿا تہ پوءِ تصديق ٿيل سانهه جي جميل بج جو استعمال ڪيو.
موجوده صورتحال ۾ بهراڙي جا نندا پاڻگيا جيڪي هن منصوبي ۾ شامل انهن وٽ پنهنجا سانهه ڪونہ آهن. اهي پاڻگيا پنهنجي جانورن جي نسل کي بهتر ڪرڻ لاءِ انهن ذميندارن يا پاڙيسرين جا سانهه نسل جي واڌويجهه لاءِ استعمال ڪن ٿا جنهن ڪري اهي پاڻگيا پنهنجي جانورن لاءِ چونڊجي ترجيحات کان محروم آهن.
سنڌ صوبي ۾ مينهن ۾هٿرادو نسل ڪشي وارو نظام هن وقت تائين ايترو عام نہ آهي. نندن پاڻگين لاءِ اهو بهتر آهي تہ تصديق ٿيل سانهه جي جميل بج جو هٿرادو نسل ڪشي ذريعي استعمال ڪن پر اهي انهي مهارت کي حاصل ڪرڻ ۽ اپنائڻ ۾ ايا وقت لڳندو.
اچو تہ هينئين طريقي سان پنهنجي سانهه جي سڃاڻپ ڪريون
a) ڪير جي پيداواري صلاحيت جي ڳالهه ٻولهه ذريعي معلومات ونڻ
i. ڳئون/ مينهن جي ماءُ ۽ پيءُ جي پيداواري صلاحيت معلوم ڪرڻ
ii. ڳئون/ مينهن جي ڏيءُ جي ڪير جي پيداواري صلاحيت معلوم ڪرڻ جيڪڏهن تہ.
b) توليدي صلاحيتن جي چڪاس/ تصديق ڪرڻ
i. چڙهڻ جي خواهش/ رغبت رکندڙ هجي.
ii. مضبوط جنگهن جو هئڻ (جيئن آرام سان چڙهي سگهي)
iii. اکين جو صحتمند هئڻ
iv. آنورن جو مناسب/ موزون هئڻ ۽ ٻنهي پاسن کان هڪجهڙا ۽ هڪجيترا هجن.

[Good bull]

			
Photo 2-9 Testicle equal on both side (Symmetrical)	Photo 2-10 Testicle equal on both side(Symmetrical)	Photo 2-11 Scrotum circumference	Photo 2-12 Strong legs

[Bad bull]

			
Photo 2-13 Testicle is not equal (Asymmetrical)	Photo 2-14 Teared scrotum, Right scrotum	Photo 2-15 Twisted testicles, left scrotum is	Photo 2-16 Abnormal front leg

	was not fully developed.	inside.	

جانورن جو واپار

2.3.1 واپار جا مقصد

جانورن جي واپار جو بنيادي مقصد بهراڙي جي پاڻين جي آمدني وڌائڻ ۽ مالوندن جي زندگي جي معيار کي بهتر ڪرڻ آهي. جانورن جي ڪير جي پيداوار ۽ ڪير مان نهندڙ شيون جهڙوڪ گيهه، مکڻ، لسي ۽ ڏئنورو ناهي سڀ اڳهه تي وڪرو ڪري پاڻين جي آمدني ۾ اضافو ڪجي.

ان جو اهو به خاص مقصد آهي ته اُهي پاڻيا جن کي انهن شين کي وڪرو ڪرڻ جي جاڻ نه آهي ته ڪيئن ۽ ڪٿي وڪرو ڪجي. اهڙن پاڻين کي انهن شين جي وڪري بابت معلومات ڏجي ته جيئن ڪير ۽ ان مان نهندڙ شين کي بازار ۾ بهتر اڳهه تي وڪرو ڪري آمدني حاصل ڪري سگهن.

مالوندن کي ان ڳالهه جو خاص خيال رکڻ گهرجي ته خريدار جي گهرج/ ضرورت کهڙي آهي. ان کي مدِ نظر رکندي ڪير ۽ ان مان نهندڙ شين کي وڪرو ڪري.

2..2.3 جانورن جي واپار جون بنيادي ڳالهيون

سڀ کان پهريان ته توسيع ورڪر ۽ وٽرنري ڊاڪٽر کي جانورن جي واپار جي بنيادي ڳالهين کي سمجهڻ جي ضرورت آهي. جانورن جي مارڪيٽ جون بنيادي ڳالهيون فني مهارتن واري گائيڊلائين مان پڙهڻ گهرجن. " واپار ۽ جانورن جي واپار جي بنيادي ڳالهين جي لاءِ گائيڈلائين.

2.3.3 ڪير جو واپار

(1) واپار کي سمجهڻ

1) توسيع ڪارڪن ۽ وٽرنري ڊاڪٽر کي ڪير جي واپار جي جاڻ هجڻ ضروري آهي. اڳواڻ ڳوٺ جي ويجهي ڳوٺ، ننڍي شهر ۽ وڏي شهر ۾ ڪير جي دڪان ۽ چانهه جي دڪان وغيره کان ڪير جي وڪري ۽ خريد جي اڳهه جي جاڻ هڻڻ گهرجي. هيٺ ڏنل ٽيبل ۾ مهيني وار تفصيل گڏ ڪيل آهي، جيڪا جائيڪا جي منصوبي "سنڌ جي بهراڙي لاءِ چوپائي مال جي پائيدار ترقي وارو منصوبو" ۾ڪئي وئي آهي. توسيع سرگرمين جي شروع ڪرڻ کان پهريان وٽرنري ڊاڪٽر ۽ توسيع ڪارڪن کي ويجهي مارڪيٽ جي جاڻ هڻڻ گهرجي.

ٽيبل1 مهيني وار تفصيل گڏ ڪرڻ جي ذريعي حاصل ڪيل مارڪيٽ جي جاڻ

ڪير جي دڪان جو نالو	خريد ڪيل ڪير جو مقدار	ڪير جي خريداري جو اڳهه	ڪير جي خريداري جو ذريعو	ڪير جي وڪري جو مقدار	ڪير جي وڪري جي قيمت	اضافي ڪير خريد ڪرڻ جو امڪان
--- ڪير جو دڪان ڪاري موري حيدرآباد	80 ليٽر	67.5 روپيه في ليٽر	ڪير جو واپاري	ڪير 40 ليٽر ڏئنورو 25 ڪلو	ڪير80 روپيه في ليٽر ڏئنورو 100 روپيه في ڪلو	ڪير خريد ڪرڻ جي گنجائش آهي جيڪڏهن ڪير صاف ۽ سنو هوندو

2) اچو ته پاڻين کي مارڪيٽ بابت جاڻ ڏيون

مٿئين ڏنل ٽيبل ۾ مارڪيٽ جي ڄاڻ ڪجهه پاڻيا سمجهي سگهن ٿا. پر گهٽن پاڻين کي ان جي ڄاڻ نه آهي. تنهن ڪري اهو ضروري آهي ته پاڻيا مارڪيٽ جي موجوده حالت پنهنجو پاڻ سمجهن ۽ مارڪيٽ جي حساب سان پنهنجو پاڻ عمل جي شروعات ڪن. مارڪيٽ ۽ عمل درآمد ڪرائڻ لاءِ پاڻين جون گڏجاڻيون ڪرائجن. مارڪيٽنگ گڏجاڻين جو بنيادي طريقه ڪار فني مهارتن واري گائيڊلائين ۾ تفصيلي ڏنل آهي. ڪير ۽ ڪير مان نهندڙ شين جو ورڪشاپ ڪيئن ڪرائجي گائيڊ لائين ۾ موجود آهي.

مهرباني ڪري پاڻين سان ڳالهه ٻولهه ڪئي وجي ته ڪير جي مارڪيٽنگ چينل کي ڪيئن سڌاريو وجي. اڳواڻ پاڻيي ۽ ٻين جون مارڪيٽنگ جون سڃيون ڪهاڻيون ٻڌائي مارڪيٽنگ ورڪشاپ ڪرائي هدايتون ڏنيون وجن. مارڪيٽنگ جي سڃين ڪهاڻين جو خلاصو فني مهارتن جي گائيڊلائين ۾ آهي. "سڃي ڪهاڻي جي لاءِ هدايتون ۽ مثالي مستحڪم مارڪيٽنگ"

جڏهن توسيع ڪارڪن ۽ وٽرنري آفيسرڪي تربيت يا گڏجاڻي دوران ڪا سڃي ڪهاڻي هدايتن واري ڪتاب ڪان علاوه ملي ته ان جي ڄاڻ ٻين ضلعن جي توسيع ڪارڪنن، وٽرنري ڊاڪٽرن ۽ جانورن جي واپار جي ڪائونٽرپارٽ ڪي ضرور ڏين ته ان نئين معلومات کي بهتر انداز ۾ گائيڊلائين ۾ شامل ڪري سگهجي.

(2) اهوڪير وڪرو ڪرڻ جنهن جي مارڪيٽ ۾ ضرورت آهي.

صاف ستري ڪير جي خريدار جي تلاش ڪرڻ جيئن مدل مين (وچ وارو ماڻهو) ڪير جا دڪان، ويجها گهر ۽ ڊيري ڪمپنيون بهتر اڳهه تي ڪير وڪرو ڪرڻ لاءِ صرف اهو طريقو نه آهي. بهتر خريدار جي تلاش ڪرڻ لاءِ پاڻين کي ٻه اهم قدم ڪٽڻ گهرجن. جيڪي پاڻيا پنهنجو پاڻ ضابطي ۾ آڻي سگهن ٿا. اهي ٻه اهم قدم هيٺ ڏنل آهن.

(1)سنو ڪير پيدا ڪرڻ

* سني ڪير پيدا ڪرڻ جو مطلب 1) ڪير ۾ پاڻي جي ملاوت نه هڻڻ گهرجي، 2) جراثيم کان پاڪ ۽ وڌيڪ سٽي وارو ڪير هڻڻ گهرجي.

(2) بازار جي گهرج مطابق ڪير جو مقدار پيدا ڪري وڪرو ڪرڻ

* اهو محسوس ڪرڻ گهرجي ته اڪيلي ڪير وڪرو ڪرڻ سان ڪير جو اڳهه گهٽ ملندو آهي. پر مجموعي طور تي پاڙي وارن يا ڳوٺ وارن سان ملي ڪير گڏ ڪري وڪرو ڪجي ته ڪير جو اڳهه تمام سنو ملندو آهي.

ڪير جا خريدار عام طور تي مٿي ڄاڻايل حالت ڏانهن ڏسندا آهن.

جيڪڏهن توهان مٿي ڏنل ڳالهين تي عمل ڪندا ته ڪير جا خريدار يقيناً توهان وٽ پهچندا ۽ پاڻيا وڌيڪ منافعي تي ڪير وڪرو ڪري سگهندا.

* هن ڳالهين تي سوچڻ شروع ڪيو.
* سوچيو توهان کي ڇا ڪرڻ گهرجي.

(1) سني ڪير جي پيداوار

a) پاڻي جي ملاوت کان پاڪ ڪير

سمجهو ته توهان ڪير واپرائڻ وارا آهيو.
توهان ڪهڙو ڪير پيئڻ پسند ڪندو. خالص ڪير يا پاڻي مليل ملاوت وارو ڪير
توهان سني ڪير پيدا ڪرڻ جي ڪوشش ڪيو توهان ۽ توهان جا ڳوٺاڻا فخر محسوس ڪندا.
جيڪڏهن توهان ڪير ۾ ملاوت نه ڪندا آهيو ته ڪير خريد ڪرڻ واري جو اعتماد توهان تي وڌندو.
توهان ڪير کي سني اڳهه ۾ وڪرو ڪرڻ جي لاءِ ڪامياب ٿي ويندا.

b) جراثيم کان پاڪ ڪير

جراثيم کان پاڪ کير پيدا ڪرڻ جي لاءِ ان ڳالهه جي ضرورت پوندي ته کير ڏهڻ واري جڳهه تي اهي سهولتون ناهيون وجن جيئن کير ۾ ڪا مٽي يا برسات جو پاڻي نه وڃي.
ان مقصد کي حاصل ڪرڻ لاءِ الف) کير ڏوهڻ جي جاءِ تي ڇت ناهي وڃي ۽ ب) گهرج آهر فرش ناهيو وڃي.

i . ڇت

ڇت ناهڻ لاءِ ڪو به سامان استعمال ڪري سگهجي ٿو جيڪو گرمين ۾ ٺڪار ڏي ۽ سردي ۾ گرمائش ڏي. سني هوا جي سني گذر لاءِ جيترو ممڪن ٿي سگهي ته ڇت کي مٽي رکو. ڇت جي پوئين پلر جي ڏيگهه 2.5 ميٽر هجي ۽ اڳيان وارا پلر 50 سينٽي ميٽر هجن. پوين پلرن کان ته جيئن هوا جو گذر سنو ٿي سگهي. اهڙي طرح سان ڇت ناهيو ته جيئن گهٽ ۾ گهٽ ڏينهن ۾ هڪ دفعو اس اندر اچي ته جيئن فرش سڪل رهي.

Photo 2-17 Thatched roof

Photo 2-18 Reed stalk roof

Photo 2-19 Roof with Slate

i . فرش

فرش لاءِ ڪو به سامان جهڙوڪ سرون، سينمنٽ، بلاڪ ۽ ڪاني جا تختا استعمال ٿي سگهن ٿا. مٽي جي ليپي ڪرڻ سان زمين سخت به ٿيندي ۽ مٽاهين به ٿيندي. زمين جو اڳيون حصو مٽاهون رکجي ته جيئن پاڻي جو نيڪال صحيح ٿي سگهي. ڏوهائي کان پهريان، ڏوهائي دوران ۽ ڏوهائي کانپوءِ فرش هميشه صاف رکجي ته جيئن کير ۾ گند ڪچرو ۽ مٽي نه وڃي.

Photo 2-20 Bricks

Photo 2-21 Concrete

Photo 2-22 Block

i . تيز هوا کان بچاءُ جا اُپاءَ- پهرين توهان اها جانچ وٺو ته سڄي سال ۾ تيز هوائون ڪهڙي طرف کان هلن ٿيون. هڪ پاسي عارضي چپرو ناهيو جيڪو اهڙين هوائن ۾، بدلجندڙ موسم ۾ آرام سان هٽائي ۽ لڳائي سگهجي.

		
Photo 2-27 Twig	Photo 2-28 Sugarcane top	Photo 2-29 Reed

2) کير جي پيداوار وڌائڻ ۾ انهي کي وڪرو ڪرڻ

هڪ اڪيلي ڳڻڻي لاءِ ۾ وڌيڪ کير جي پيداوار حاصل ڪرڻ ۾ ان کي وڪرو ڪرڻ مشڪل آهي. انهي لاءِ ضروري آهي ته کير جو وڪرو بين ڳڻڻين سان، پاڙي وارن سان ۾ ڳوٺ وارن سان گڏجي ڪجي ته جيئن کير جي وڪري جو سٺو اڳهه حاصل ڪري سگهجي. جيڪڏهن اڳواڻ ڳڻڻيو سمجهي ٿو ته کير کي پاڙي وارن يا ڳوٺ وارن سان گڏجي وڪرو ڪري سگهجي ٿو ته اهو عمل سيني ڳڻڻين لاءِ بهتر ثابت ٿيندو. کير گڏجي وڪرو ڪرڻ سان ڳوٺ جي سيني ڳڻڻين کي کير جو بهترين اڳهه ملندو.

باب ٽيون

گاھ ۽ گاھن کي کارائڻ جي سارسنيال (ڳئون ۽ مينھن کي)

پھرين اسان کي اھا معلومات حاصل ڪرڻي پوندي تہ اسان جي ڳئون/ مينھن پنھنجي پوري صلاحيت ظاھر ڪري ٿي نہ جيتري اميد آھي اوتري کير جي پيداوار جي مقدار وڌائي.
پھريان اسان کي گاھن جي معلومات ونڊي پوندي انھي کانپوءِ انھن تي صحيح کارائڻ جو طريقو،
مينھن ۽ ڍڳي جي ڊيڪپڊ جي دوران ۽ ويامڻ کانپوءِ انھن کي گاھ کارائڻ جو صحيح طريقو

3.1. گاھن جا قسم ۽ انھن جي استعمال جو طريقو

3.1.1 ساوا ۽ سڪا گاھ

ساوا ۽ سڪا گاھ جانور جي جسم جي واڌويجھ ۽ صحت کي برقرار رکڻ لاءِ کارايا ويندا آھن. انھن ۾ ريشو وڌيڪ ۽ غذائي جزا گھٽ ھوندا آھن. جڏھن تہ اھو جانور جي اوجھ کي حرڪت ۾ رکي ٿو.

1) بھ ۽ پلال
انھن ۾ پاڻي ۽ غذائي جزا گھٽ ھوندا آھن.
2) ساوا گاھ
ھن ۾ پاڻي وڌيڪ ۽ غذائي جزا سڪل گاھن کان وڌيڪ ھوندا آھن.
3) گڏيل سڪا ۽ ساوا گاھ (ڪتر)
پاڪستان ۾ اھو چاري جو نمونو عام آھي. اھو ھڪ سٺو چاري جو نمونو آھي. گڏيل تازا ساوا گاھ جن ۾ پاڻي ۽ غذائي جزا وڌيڪ ھوندا آھن ۽ سڪل گاھ جنھن ۾ پاڻي ۽ غذائي جزا گھٹ مقدار ۾ ھوندا آھن.

Photo of roughage

Photo 3-1 Rice straw: low water content and low in nutrients

Photo 3-2 Wheat straw: low water content and low in nutrients

	
Photo 3-3Green grass: High water content and relatively many nutrients	Photo 3-4Mixed feed of green fodder and wheat / rice straw

هاڻي گاهه کي ماڻ گراس ۾ چئبو آهي. موسم/ ماحول جي حساب سان هاڻي گاهه تڪڙو وڌندو آهي. تنهن ڪري اهو سولائي سان پوکي سگهجي ٿو. جيڪڏهن پاڻگئي کي پنهنجي زرعي زمين هوندي ته پاڻگيو اهو گاهه پوکي سگهي ٿو. جيڪڏهن ڪنهن پاڻگئي کي پنهنجي زمين نه هجي ته اهو ٻئي ڪنهن پاڻگئي جي زمين جي ٻنن تي يا گهرجي ويجهو ڪنهن خالي زمين تي پوکي سگهجي ٿو. اهو گاهه سردي ۾ وڌڻ بند ٿي ويندو آهي ۽ گرمي ۾ تڪڙو وڌندو آهي. هاڻي گاهه کي پورو پاڻ ڏجي ۽ ٻن سالن ۾ هڪ دفعو ڏجي. جڏهن 130 سينٽي ميٽر ٻوٽي جي ڊيگهه ٿئي ته ان مان اسان تمام گهڻا ساوا پتا ۽ پروٽين حاصل ڪري سگهون ٿا. هن جي ڊيگهه 2.5 سينٽي ميٽر کان 3 سينٽي ميٽر تائين ٿيندي آهي. ڏنڊي جي ڊيگهه وڏي ٿيندي آهي ته اها سخت ٿي ويندي آهي ۽ غذائي جذا ۾ گهٽجي ويندا آهن. جانورن کي صحيح گاهه مهيا ڪرڻ لاءِ پاڻگئي کي هاڻي گاهه جي ڊيگهه جو خيال ڪرڻو پوندو.

	
Photo 3-5 Ideal height of grass	Photo 3-6 Planting of cutting stem

Photo 3-7 Overgrown stem, low nutritive value

3.1.2 راشن (داڻيدار خوراڪ)

داڻيدار خوراڪ جا مختلف قسم ٿين ٿا ۽ هر هڪ داڻيدار خوراڪ جي غذائي اهميت ۽ مختلف ٿئي ٿي.

داڻيدار خوراڪ جا مختلف قسم ٿين ٿا ۽ هر هڪ داڻيدار خوراڪ جي غذائي اهميت ۽ مختلف ٿئي ٿي. عام طور تي پاڪستان ۾ داڻيدار خوراڪ جهڙوڪ ڪڻڪ جي ڪڻ، ڪڻڪ جو پوسو، چانورن جي ڪڻي ۽ سورج مکي جي ڪڻ وغيره شامل آهن. سنڌ صوبي ۾ اڪثر پاڳيا گهٽو ڪري هڪڙي قسم جي داڻيدار خوراڪ يا ڳڙيل داڻيدار خوراڪ ڏين ٿا. فارمولا فيڊ ڪجهه قسمن جي خوراڪ تي مشتمل آهي ڪجهه قسمن جي داڻيدار خوراڪ جهڙوڪ (لوڻ ۽ منرل) جيڪي جانور جا جسماني ۽ غذائي مقصد پورا ڪري سگهن.

فارمولا فيڊ جا ٽي قسم آهن. هڪ ڪير جي پيداوار وڌائڻ لاءِ، ٻيو گوشت جي پيداوار وڌائڻ لاءِ ۽ ٽيون ڦرن جي پيداوار لاءِ

Photo of concentrate

Photo 3-8 Concentrate is necessary for milk production.

Photo 3-9 There are many kinds of concentrate.

	
Photo 3-10 Formula feed making	Photo 3-11 Example of formula feed

3.1.3 کير جي پيداوار وڌائڻ لاءِ خوراڪ جا مثال

کير وارن جانورن جي کير جي پيداوار کي وڌائڻ لاءِ ضروري مقدار ۾ خوراڪ ڏجي جنهن ۾ ساوا سڪا گاهه ۽ داڻيدار خوراڪ شامل آهي.

(3) کير وارن جانورن لاءِ فارمولا فيڊ واري خوراڪ

1) منصوبي جي طرفان کير وارين مينهن/ ڍڳين لاءِ فارمولي واري خوراڪ

منصوبي عام استعمال ٿيندڙ داڻيدار خوراڪ مان فارمولي واري خوراڪ تيار ڪئي آهي. ٽيبل 3-3 ۾ مادل 1 ۾ ڪڪڙن جي ڪڙ استعمال ڪئي ويئي آهي. پوءِ منصوبي حيدرآباد جي لوڪل مارڪيٽ ۾ سستي اڳهه ۾ ٻاهرين سرنهن جي ڪڙ ڳولهي ورتي ان ڪري 2 مادل ۾ سڀني خاصيت واري سرنهن جي ڪڙ استعمال ڪئي ڪڪڙن جي ڪڙ جي بدلي ۾، ڪڪڙن جي ڪڙ گهٽو ڪري ايفلاٽاڪزن زهريات جو سبب ٻڌجندي آهي. ڪڪڙن جي ڪڙ کي هٽائي ڪري سرنهن جي ڪڙ وڌي وئي آهي ته جيئن ايفلاٽاڪزن کي ختم ڪري سگهجي. کير وارن جانورن لاءِ فارمولا فيڊ کي غذائيت سان پرپور ۽ متوازن ڪرڻ لاءِ اضافي وٽامنز ۽ نمڪيات وڌايا ويا آهن.

Table 3-3 Formula feed designed and produced by the Project

	Model 1	Model 2
Name of Feed	Mixed proportion %	Mixed proportion %
Maize crush	10	25
Wheat (Crush)	5	20
Cotton Seed cake	13	0
Rice polish	6	0
Wheat Bran	35	30
Sunflower Seed	30	17
Soybean	0	7
dcp(Bone meal)	1	1
Total	100	100
TDN:	67.0	74.9
CP:	18.0	18.4

3.2 کاڌخوراڪ جي سارسنڀال ڏيکي مينهن جي ويم کان پهريان ۽ پوءِ

3.2.1 ويامڻ کان پهريان

ويامڻ کان پهريان فارمولافيڊ جي شروعات 3 هفتا پهرين ڪرڻ کپي. جيئن جانور جو جسم خوراڪ تي هري وجي. جانور جي اوجھ ۾ ڪيترائي جيوڙا جھڙوڪ بيڪٽيريا ۽ پروٽوزوا موجودا هوندا آهن، جيڪي کاڌي جي پنج ڏاھ ۾ مدد ڪندا آهن. فارمولا فيڊ ويامڻ کان پهريان ان لاءِ کارائي ويندي آهي ته جيئن جانور اوجھ ۾ موجود جيوڙا پنهنجو پاڻ کي ان خوراڪ تي هيرائن ته جيئن هاضمي جو عمل صحيح نموني ٿي سگھي.

شروعاتي ڏينهن ۾ 1 ڪلوگرام کان 2 ڪلوگرام فارمولا فيڊ ڏين گھرجي ان کانپوءِ آهستي آهستي وڌائڻ گھرجي، جيڪڏهن جانور ڪمزور آهي ته ان کي هڪ ڏينهن ۾ 3 ڪلوگرام فيڊ ڏين گھرجي. هڪ ڏينهن ۾ 3 ڪلوگرام خوراڪ کان مٿي نه وڌائجي. فارمولا فيڊ جي مقدار ساڳي رکجي ويامڻ تائين. ويامڻ کان پهريان فارمولا فيڊ کارائڻ تمام ضروري آهي، ڪير جي سڀني پيداوار حاصل ڪرڻ لاءِ.

ٽيبل 5-3 ويامڻ کان پهريان خوراڪ ڏيڻ جو چارٽ

	خوراڪ ڏيڻ جو وقت	ٿلهي	نارمل	ڪمزور
باکڙي	ويامڻ کان 3 هفتا پهريان	1	2	3

3.2.2 ويامڻ جي وقت

ويامڻ کان پهريان حفاظتي اپاءُ ونڊ ضروري هوندا آهن.

جيڪڏهن جانور ڏينهن جي وقت ويامي ٿو ته ان کي ٿڌي جاءِ تي رکجي. جيڪڏهن مينهن رات جي وقت ويامي ٿي ته ان کي سنڀال ڪرڻ واري جي پاسي ۾ ٻڌو وجي ته جيئن جانور جي سارسنڀال لهڻ ۾ آساني ٿئي. جانور جو جلدي علاج ڪيو جراثيمن کان پاڪ رکڻ لاءِ. اهو يقيني رکو ته جڏهن ڏکيو ويم ٿئي ته جانورن جي ڊاڪٽر سان رابطو ضرور ڪيو. ويم کان پوءِ جر تقريباً 6 کان 8 ڪلاڪن ۾ باهر اچي ويندي آهي. ان صورت ۾ جڏهن ويم کانپوءِ 12 ڪلاڪن تائين جر باهر نٿي اچي ته اهو جر جو قاسڻ هوندو آهي. ان صورت ۾ جانورن جي ڊاڪٽر سان رابطو ڪري ضروري علاج ڪرايو.

3.2.3 ويامڻ کانپوءِ (ڪير وارو ٽائيم)

(1) گاھ کارائڻ

1) سڀني قسم جا گاھ مهيا ڪرڻ.

اوگر ورائيندڙ جانور جي لاءِ سڪا گاھ تمام ضروري آهن.

پر ڏنو وجي ته سنڌ صوبي ۾ تمام گھٽو مشڪل آهي ته سڀني مقدار ۽ معيار وارا سڪا ۽ ساوا گاھ سڄي ڪير ڏيڻ واري عرصي داورن مهيا ڪيا وجن. هي ساوا گاھ وڌيڪ غذائيت وارا ساوا گاھ مهيا ڪيا وجن جنهن کي جانور وڌ کان وڌ پسند ڪري. جھنگلي گاھن جي صورت ۾ غذائيت وارو گاھ جيئن ڇبر جنهن ۾ وڌيڪ ساوا ۽ سنها نرم پن ٿين ٿا.

اسردين جي موسم ۾ سڪن گاھن جو معيار گھٽجي ويندو آهي. ان صورت ۾ اها صلاح ڏني ويندي آهي ته ساوا گاھ جيئن لوسڻ ملائي کارائجي سڪي گاھ سان ته جيئن جانور جي جسم کي ضروري پروٽين ملي سگھن.

جيڪڏهن اسان ساون پنن ساين ڪانين ۽ سڪل ڪانين جو پروٽين وارو جزو ڏسون ته ساون پنن ۾

اهو وڌيڪ هوندو آهي. بنسبت ساين ڪانين ۽ سڪل ڪانين جي. سني قسم جي سڪن ۽ ساون گاهن جو مطلب آهي ته جنهن ۾ ساوا پن وڌ ۾ وڌ هجن.

(2) فارمولا فيڊ خوراڪ

جيڪڏهن توهان جي ڪير جو وڪري وارو اگهه وڌيڪ آهي فارمولا فيڊ جي اگهه ڪان ته توهان فائدي ۾ آهيو. منصوبو توقع رکي ٿو ته مستقبل ۾ پاڳيا پنهنجي پئسن مان فارمولو فيڊ خريد ڪندا ۽ ڪير جي پيداوار مان وڌيڪ منافعو ڪمائيندا.

فارمولا فيڊ جي مقدار

جانورن جي جسماني حالت ۽ ڪير جي پيداوار جي حساب سان فامولي فيڊ جي مقدار رکي ويئي آهي. جانور جي جسماني حالت نارمل هجي ته هيٺ ڏنل 3-6 ٽيبل جي وچين ڪالم مطابق کارائي وڃي جيڪڏهن جانور ٿلهو آهي ته ڪابي پاسي واري ڪالم مطابق ۽ جيڪڏهن جانور ڪمزور آهي ته ساڄي پاسي واري ڪالم مطابق فارمولي فيڊ جي مقدار ڏني وڃي.

Table 3-6 Formula feed provision table (after parturition)

	Condition Nutrition	Fatty	Normal	Emaciated
Milk production	Milk Prod. Up to 2 Liter	1 Kg	1 Kg	1.5 Kg
	Milk Prod. 2.1～4 Liter	1.5 Kg	2 Kg	2.5 Kg
	Milk Prod. 4.1～6 Liter	2.5 Kg	3 Kg	3.5 Kg
	Milk Prod. 6.1～8 Liter	3.5 Kg	4 Kg	4.5 Kg
	Milk Prod. 8.1～10 Liter	4.5 Kg	5 Kg	5.5 Kg
	Milk Prod. More than 10 Liter	5 Kg	5.5 Kg	6 Kg

Photo 3-25 Technical guidance to feed proper volume of formula feed

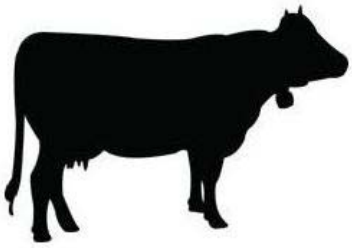
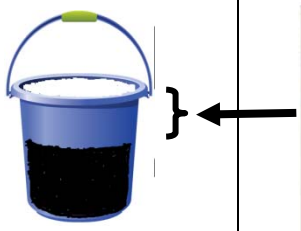
Photo 3-26 Formula feed provision during milking time

(3) جانور کي رف ايج ڪيتري مقدار ۾ ڏنو وڃي ٿو ۽ ڪهڙي خاصيت وارو آهي ان حساب سان فارمولي فيڊ جي مقدار مقرر ڪئي وڃي.

(1). ساوا گاهه مهيا ڪرڻ، ان صورت ۾ جڏهن سا وا گاهه سني معيار ۽ گهربل مقدار ۾ موجود هجن.

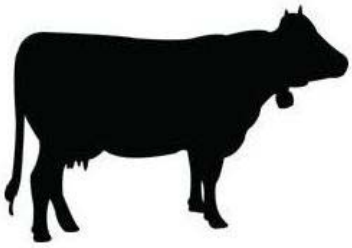
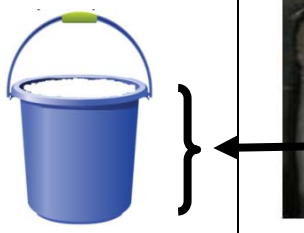
جسم جي صحت کي برقرار رکڻ لاءِ 100 فيصد طاقت گاهن مان ملي ٿي ۽ 50 فيصد ڪير جي پيداوار پڻ گاهن مان وڌي ٿي.

ان صورت ۾ 1/3 مقدار فارمولا فيڊ جي جيڪا مٿي ڏنل ٽيبل ۾ ٻڌائي ويئي آهي اها مناسب آهي ته ڪجهه حالتن ۾ هڪ نارمل جسامت واري جانور کي جيڪو 5 ڪلوگرام ڪير ڏئي ان کي 3 ڪلوگرام فارمولا فيڊ ڏيڻ گهرجي، جڏهن ته ٻڌايل مقدار ۾ فارمولا فيڊ جي 1/3 گهربل مقدار ۽ سڀني معيار واري خوراڪ ساڳي جانور کي ڪارائجي. جيڪا 33 فيصد ، 3 ڪلوگرام جو برابر آهي 1 ڪلوگرام جي.

Provision of Roughage	100% energy to maintain body can be obtained from roughage only.	A part of energy to produce milk can be obtained from roughage.	Quantity of formula feed is given1/3 of the above cited table.
1) **Good Quality** 2) **Sufficient Quantity**			

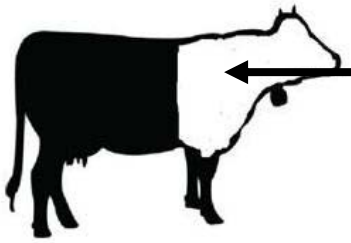
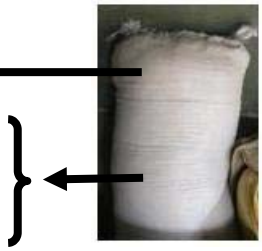
(2). ساوا گاهه مهيا ڪرڻ ان صورت ۾ جڏهن گاهن جي معيار وچولو هجي ۽ مقدار پڻ ٿورو گهٽ هجي.

جسم جي صحت کي برقرار رکڻ لاءِ 100 فيصد طاقت صرف گاهن مان ملي ٿي. فارمولا فيڊ مان ضروري آهي ته 100فيصد طاقت ونون ڪير جي پيداوار وڌائڻ لاءِ، جيڪا فارمولا فيڊ جي مقدار ٻڌايل آهي اها وڇئين خاني جي حساب سان ڪارائجي. اسان کي اها خبر هجڻ کپي ته روزانو 5 ڪلوگرام ڪير ڏيڻ واري مينهن کي 3 ڪلوگرام فارمولا فيڊ ڪارائجي.

Provision of roughage	100% energy to maintain body can be obtained from roughage only.	Energy to produce milk cannot be obtained from roughage.	Formula feed is given according to the table above.
1) **Quality is mediocre** 2) **Quantity is less than enough**			

(3). گاهه مهيا ڪرڻ، ان صورت ۾ جڏهن گاهن جي تمام خراب معيار ۽ تمام گهٽ مقدار هجي.

گاهن مان صرف 50 فيصد طاقت ملي ٿي جانور جي صحت برقرار رکڻ لاءِ. رهيل 50 فيصد طاقت صحت برقرار رکڻ لاءِ ۽ 100فيصد طاقت ڪير جي پيداوار وڌائڻ لاءِ. ضروري آهي ته فارمولا فيڊ ڪارائجي . تنهن جي لاءِ جيڪا مقدار آهي فارمولا فيڊ جي ڏني وڃي مٿي ڄاڻايل تصوير جي ڪابي پاسي واري خاني جي حساب سان ان لاءِ اسان کي اها ڄاڻ هجڻ گهرجي ته هڪ نارمل جسامت رکندڙ جانور جيڪو ڏينهن ۾ 5 ڪلوگرام ڪير ڏئي ٿو ان کي 3.5 ڪلوگرام فارمولا فيڊ ڪارائجي.

Provision of roughage	Energy to maintain body can only partially filled by roughage. (white parts represent deficit of energy)	Energy to produce milk cannot be obtained from roughage.	Formula feed for emaciation condition in the above table is shown. In some cases, more quantity of feed is given to an animal, if necessary.
3) **Quality is bad** 4) **Quantity is not enough**			

(4). فيڊنگ خوراڪ ڏيڻ (شروعاتي خوراڪ)

اڇو ته شروعاتي خوراڪ ۽ وڌندڙ خوراڪ سڀ کان اثر وڌي خوراڪ تي، اها ڳالهه توهان کي ٿورو منجهائيندي پر توهان کي سگهو ٿا جيڪڏهن توهان سڀ کان عمل ڪرڻ وارا آهيو. شروعاتي خوراڪ ۽ وڌندڙ خوراڪ شروع ڪرڻ کان پهريان اڇو ته ڏسون ته هڪڙي معيار ڪير جي پيداواري لائين کي.

تصوير نمبر 3 ۾ ڪير جي پيداوار، فارمولا فيڊ ڏيڻ ۽ مينهن جي غذائي حالت ڏيکاري وئي آهي. پيلي رنگ جي لائين ڪير جي پيداوار ڏيکاري ٿي. جڏهن ته اسان مينهن کي وقت سر وقت پوري خوراڪ ڏيون ٿا ۽ پورو فارمولا فيڊ ڪارايون ٿا ته اها مينهن اسان کي وڌيڪ ڪير جي پيداوار ڏئي ٿي. اهو هيٺ ڏنل لائين ۾ ڏيکاري وئي آهي.

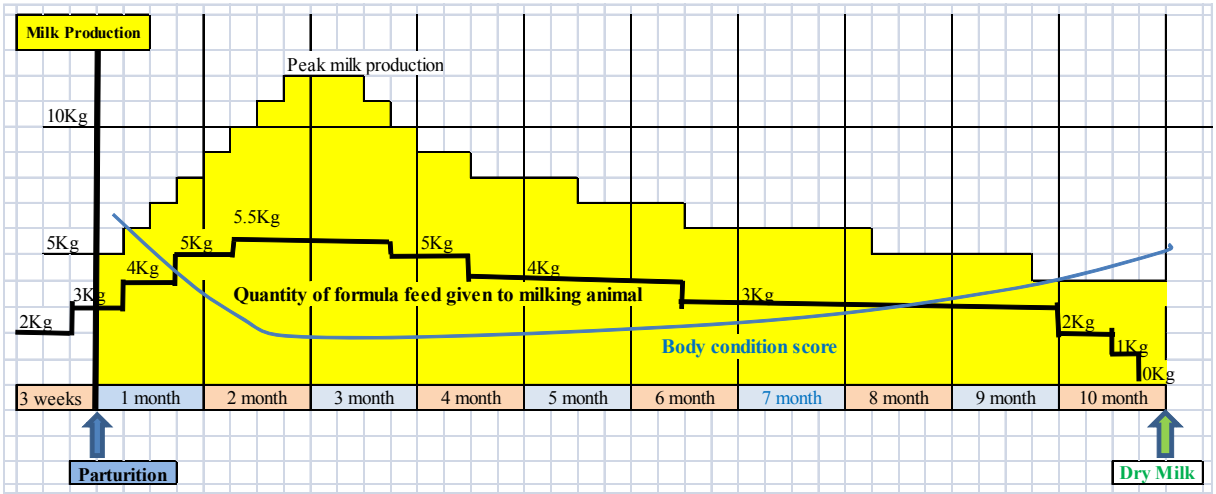


Figure 3-5 Standard Feeding for milking buffalo

الف. ويامڙ کان پهريان جي خوراڪ

ويامڙ کان تقريبن 3 هفتا پهريان مينهن ۽ ڳئون کي فارمولا فيڊ کارائڻ شروع ڪجي ته جيئن اوجهه ۾ موجود بيڪٽيريا ۽ پروٽوزووا ان خوراڪ جا عادي ٿي وڃن. فارمولا فيڊ 2 ڪلوگرام کان شروع ڪرڻ گهرجي ۽ اها وڌائي 3 ڪلوگرام تائين کارائڻ گهرجي.

ب. ويم کان پوءِ کير جي عرصي دوران وڌندڙ خوراڪ

ويامڙ کانپوءِ آهستہ آهستہ کير جي پيداوار وڌندي رهندي آهي. تنهن جي لاءِ فارمولا فيڊ کير جي واڌ جي حساب سان وڌائڻ گهرجي ان کي ويم کانپوءِ کير جي عرصي دوران وڌندڙ خوراڪ چئبو آهي.

ويامڙ جي 3-2 مينهن تائين کير جي وڌيل مقدار ريڪارڊ ڪيو ويو آهي. ان عرصي دوران جيڪو گاهه خوراڪ کارايون ٿا اهو کير جي پيداوار وڌائڻ لاءِ پورو نہ هوندو آهي. مينهن ۽ ڳئون پنهنجي جسم جا جمع ٿيل جزا کير جي پيداوار وڌائڻ لاءِ استعمال ڪندي آهي. ان سبب جي ڪري مينهن پنهنجو جسماني وزن گهٽ ڪري ويندي آهي. تصوير نمبر 3 ۾ نيري رنگ واري لائين ۾ جسماني حالت جي ڳٽپ جو وڪڙ ڏيکاريو ويو آهي.

اهو آهستہ آهستہ ويامڙ کانپوءِ گهٽجيو ويندي آهي. جڏهن کير جي پيداوار مٽي ليول کان هيٺ لهندي آهي تڏهن مينهن ۽ ڳئون وزن وڌائڻ شروع ڪندي آهي، ان وقت اسان کي فارمولا فيڊ جي مقدار گهٽائڻ گهرجي.

3.2.4 کير ڇڏي وڃڻ جي عرصي دوارن سارسنڀال

کير بند ٿيڻ وارو ٽائيم ضروري آهي اوهه کي ساهي پٽڻ لاءِ ۽ ٻئي کير ڏيڻ لاءِ تيار ٿيڻ لاءِ ضروري آهي ته 30 ڏينهن تائين ڏهائي نہ ڪرڻ گهرجي ته جيئن نوان ميمري گئلينڊ سيل نهن.

جڏهن کير جي پيداوار آهستہ آهستہ گهٽ ٿيڻ لڳي ته فارمولا فيڊ جي مقدار آهستہ آهستہ گهٽائي ڇڏجي ايتري حد تائين جو صرف مينهون/ ڳئون کي گاهه کارائڻ گهرجن ۽ اهو جاري رکڻ گهرجي کير ڏيڻ کارائڻ کير جي پيداوار ختم ٿي ويندي آهي ۽ اوهه سڪڙجڻ شروع ٿي ويندا آهن.

اهو مناسب وقت هوندو آهي جنهن ۾ اسان کي کير ڏهڻ بند ڪري ڇڏڻ گهرجي ۽ اهو خشڪ ٿيڻ جي عرصي جي شروعات هوندي آهي.

3.3 کير جي پيداوار کي وڌائڻ ۾ رڪاوٽون

سڀي ۽ معياري کير جي پيداوار اهو ظاهر ڪري ٿي ته توهان جي مينهن/ ڳئون کير جي پوري صلاحيت ڏيکاري ٿي ته توهان جي مينهن/ ڳئون کير جي پوري صلاحيت ڏيکاري ٿي. اهو محسوس ڪرڻ ته کير جي سڀ وڪڙ تڏهن حاصل ڪري سگهون ٿا جڏهن سڀي معيار جي فارمولا فيڊ کير جي پيداوار جي حساب سان جانور کي مهيا ڪئي ويندي. جيڪڏهن ايئن نہ ڪنداسين ته سان سڀي کير جي پيداوار حاصل ڪري نہ سگهنداسين ٻيون ٻہ ڪيترون صورتون آهن جيڪي کير جي پيداور تي اثر انداز ٿين ٿيون، اچو ته انهن صورتن کي ڏسون ۽ انهن صورتن کي صحيح ڪرڻ جي ڪوشش ڪريون.

3.3.1 گهٽي/ پوري پاڻي جي موجودگيءَ

چا توهان جي کير ڏيندڙ مينهن/ ڳئون وڏيڪ/ پورو پاڻي پيئي ٿي؟

اهو تمام ضروري آهي ته مينهن/ ڳئون ته گهٽو پورو ۽ تازو پاڻي پين ڇوجو اهو سڌو سنئون کير جي پيداوار تي اثر انداز ٿئي ٿو.

1) گهٽي مقدار ۾ پاڻي ڏيڻ/ آزاد پاڻي جي رسائي

جيڪڏهن توهان اهڙو ٿانو رکو ٿا جنهن مان جانور هڪ ٿائيم تي پاڻي پيئي کٽائي نه سگهي ته ان جو مطلب آهي ته توهان پنهنجو مقصد حاصل ڪري ورتو آهي مينهن ۽ ڳئون کي ضرورت مطابق ڏيڻ جو. پر ان ۾ هڪ نقصان به آهي، جيڪڏهن اهي پاڻي وارا ٿانو توهان روزانو صاف نٿا ڪيو ته پاڻي خراب ٿي ويندو ۽ اهو جانور جي صحت لاءِ نقصانڪار هوندو. پاڻي جا ٿانون کي صاف ڪرڻ وارو عمل موسم ۽ پاڻي جي ٿانو جي ماپ تي مشتمل آهي. پاڻي جي ٿانون کي روزانو صاف ڪرڻ لاءِ اهو فيصلو ڪرڻ تمام گهٽو ضروري آهي ته پاڻي جا ٿانو روزانو ڌوئي صاف ڪيا وڃن ته ان عمل سان اسان وڏي نقصان کان بچي سگهون ٿا. ترقي ڪندڙ ملڪن ۾ پاڻي جا ٿانو استعمال ٿين ٿا. اهي پاڻي جا ٿانو ننڍا هوندا آهن تقريباً 30 سينٽي ميٽر ۽ ڊائيامیٽر جا. جڏهن مينهن/ ڳئون ان ٿانو تي منهن لڳائيندي ته ان مان پاڻي نڪري ايندو. ان عمل سان مينهن/ ڳئون کي هر وقت تازو پاڻي ملي ٿو. جيڪڏهن توهان وٽ نلڪي جي پاڻي جي سهولت آهي ته جانور کي ڏيڻ لاءِ اهو توهان آساني سان استعمال ڪري سگهو ٿا. واٽرڪپ جي قيمت گهٽ آهي.

Example of water trough for free water supply:

Photo 3-27 Drum water trough

Photo 3-28 Concrete water trough

Photo 3-29 Water Cup

2) ضرورت مطابق پاڻي مهيا ڪرڻ/ محدود پاڻي مهيا ڪرڻ

ڳوناٽا پاڳيا عام طور تي جانورن ٽي دفعا پاڻي ڏيندا آهن. 1. صبح جي وقت، 2. منجهند جو ۽ 3. رات اسان توهان کي اها صلاح ڏيون ٿا ته سمهڻ کان پهريان به پاڻي ڏيئي پوءِ سمهو جيڪو مٽي جو جاٽايل پاڻي پياريو ٿا ان کان وڌائي پياريو.

3.3.2) ڪاڏي جي آهورن جي صفائي

روزانو ڪاڏي جا آهورا صاف بچيل خوراڪ ڪڍي اڇلايو جنهن آهوري ۾ بچيل خوراڪ هجي ان آهوري ۾ مينهن/ ڳئون کي نه کارايو.

اهو تمام ضروري آهي ته جانور کي روزاني جي ضرورت مطابق خوراڪ ڏيو ته جيئن گهٽي خوراڪ خراب نه ٿئي. اهو عمل روزانو جاچ جي ذريعي ڪري سگهجي ٿو ته جيئن خوراڪ گهٽ کان گهٽ ضايع ٿئي.

	
Photo 3-30 Wasted roughage by trampling	Photo 3-31 Wasted feed by adding feeding

	
Photo 3-32 Deteriorated feed in under layer	Photo 3-33 Deteriorated crumps of bread and chapatti

3.3.3. گاهن جي ڏيگهه

اهو تمام گهڻو ضروري آهي ته مينهن/ ڪٻڻ جيترو چاهي اوترو گاهه کائي گاهن جي ڏيگهه ان تي اثرانداز ٿئي ٿي.

جيڪڏهن توهان وٽ ڪٽر مشين آهي ته گاهن کي 2 کان 5 سينٽي ميٽر جي ماپ ۾ ڪٽي کارايو،
جيڪڏهن توهان وٽ ڪٽر جي مشين نه آهي ته گاهن کي چري يا ڏاڙي سان 30 سينٽي ميٽر جي ماپ ۾ ڪٽي کارايو.

	
Photo 3-34 Effective use of a chopper	Photo 3-35 Cut into length that animals easily can

	intake

3.3.4 گرمي کان بچڻ جا اُپاءَ

جيڪڏهن ماحول ۾ وڌيڪ گرمي هوندي ته گرمي جي ڌٻاءُ جي ڪري جانور جو جسماني گرمي پد وڌي ويندو ڇو جو جانور جو اوجهه ۾ پهريائين گرمي وڌيڪ هوندي آهي. ان حالت ۾ مينهن/ ڳئون ڪڏهن ٻه پنهنجي صلاحيت مطابق کير نه ڏئي سگهندي. اهو تمام گهڻو ضروري آهي ته جانور کي ٿڏي ۽ هوادار جڳهه تي ٻڌون. ان سان گڏوگڏ اهو ٻه ضروري آهي ته جانور کي وهنجارڻ يا ان جي جسم تي پاڻي جو ڦوهارو ڪجي.

جانور جي اوجهه ۾ ڪيترائي جيوڙا ۽ بيڪٽيريا موجود هوندا آهن، جيڪي گاهن جي سخت ريشي جي پنج ڏاهه ڪن ٿا. مينهن/ ڳئون جي اوجهه ۾ 200 ليٽر ڪاڌي جي گنجائش هوندي آهي. جانور جو اوجهه هاضمي جي مشين ڪاڌي کي خمير ڪرڻ جي مشين وانگر آهي ۽ اها تمام گهڻي گرمائش پيدا ڪندو آهي.

جيڪڏهن گهڻي گرمي آهي ته مينهن/ ڍڳي تي گرمي جو ڌٻاءُ پوندو ڇاڪاڻ ته معدي مان ٻه گرمائش نڪري ٿي ان حالت ۾ مينهن/ ڍڳي کير ڏيڻ جي گنجائش ظاهر نه ڪندي جيتري هو کير جي پيداوار ڏي ٿي.

(1.) سٿي هوادارا ڇت

هر موسم جي حساب سان هوا جو رخ چيڪ ڪجي ۽ هوا جي رخ مطابق واڙو ناهجيئ گرمين جي موسم ۾ ڳئون/ مينهن کي وڌين پتين ۽ ٻئي ڪنهن هوا جي رڪاوٽن واري جڳهه تي نه ٻڌڻ گهرجي.

* وڻ جي هيٺان ٻڌڻ جي صورت ۾ جنهن وڻ ۾ وڌيڪ پن هجن جيئن انب جو وڻ، بهتر هوندو آهي، انهن وڻن کان جنهن ۾ گهٽ پن هجن جيئن ٻير جو وڻ، ڇو جو انب جو وڻ جانور کي سٿي ڇانو ڏيندو آهي.

* سادي ڇت جي صورت ۾ مٽي ڇت سٿي هوا ڏيندي آهي. اها ڇت اسان بهتر ٻه ڪري سگهون ٿا، جيڪڏهن اسان لهواري ڇت ناهيون ٿا ته اُن صورت ۾ ڇت جي پويان پلر تقريباً 2.5 ميٽر جا ۽ اڳيان پلر 2.5 ميٽر کان وڌيڪ رکٽا پوندا، تڏهن سٿي هوادار ڇت نهي سگهي ٿي.

Photo 3-36 Mango trees

Photo 3-37 Tying buffaloes under the tree shade with good ventilation

Photo 3-38 Roof with good ventilation

(2) وهنجارڻ

مينهن کي وهنجڻ جي ضرورت هوندي آهي. جڏهن اسان ڳئون کي مينهن سان پيٽائيندا سين ته ان ۾ (مينهن) گرمي برداشت ڪرڻ جي صلاحيت گهٽ هوندي آهي. مينهن جي کير جي پيداوار کي برقرار رکڻ لاءِ مينهن کي وهنجارڻ ضروري هوندو آهي.

مينهن جو جسماني گرمي پد گهٽائڻ لاءِ گهٽي پاڻي ۾ ويهارڻ وڌيڪ اثرائتو هوندو آهي. وهنجارڻ لاءِ گهرائي واري جڳهه بهتر آهي مٿاهين واري جڳهه کان، جيڪڏهن پاڻي ۾ ويهارڻ واري جڳهه بهتر آهي مٿاهين واري جڳهه کان. جيڪڏهن پاڻي ۾ ويهارڻ واري جڳهه واڙي کان 30 منٽن کان وڌيڪ پري آهي ته جانور کي پاڻي ۾ ويهارڻ لاءِ نه وڻي وجو چو ته گهٽي پنڌ جي ڪري جانور جي طاقت/ سگهه گهٽجي ويندي آهي.

Photo 3-39 Bathing in shallow water (Second-best)

Photo 3-40 Bathing in deep water. Animals can soak whole body into the water. (Ideal)

(3) ڦوهارو ڪرڻ

جيڪڏهن جانور کي وهنجارڻ لاءِ سڻي جڳهه نه آهي يا اها پري آهي ته مينهن جي جسم کي ٺڏو ڪرڻ لاءِ ڦوهارو استعمال ڪيو. ڏينهن جي گرمي واري وقت جانور جي جسم ۾ مختلف وقتن تي وقفي سان ڦوهارو ڪندا رهو.

ڦوهاري ڪرڻ جا ٻه طريقا آهن. هڪ حوض مان پاڻي پري ڦوهارو ڪيو ٻيو بالٽي پري ان سان ڦوهارو ڪيو يا جسم تي هاريو. جانور کي ٻڌڻ واري جڳهه تي نه وهنجاريو چاڪاڻ جو گهم واري جڳهه گهم يا پوسل جي ڪري خراب ٿي ويندي. جانور جي ڦوهاري واري جڳهه کي پوسل کان بچائڻ لاءِ ان جو فرش ۽ نيڪال جو سسٽم ناهجي اهو فرش اسان سرن، بلاڪ ۽ ڪاني سان آرام سان ناهي بهتر ڪري سگهون ٿا.

جيڪڏهن توهان پنهنجي مينهن کي ٻڌڻ واري جڳهه تي ڦوهارو ڪيو ٿا ته بهتر آهي (نيپ سيڪ) ان جو مطلب ڪلهي ۾ بوتل پائي ڪري ڦوهارو ڪيو ويندو آهي، اهو طريقو فرش کي آلي ڪرڻ کان بچائي ٿو.

Photo 3-41Shower with water hose is less effective

Photo 3-42 Floor improvement of shower place

Photo 3-43 Knapsack type spray

(2) ٻڌڻ جو خاص طريقو

1) قطار ۾ ٻڌڻ

ڪير وارين مينهن کي هڪ قطار ۾ ٻڌڻ، هر مينهن جي لاءِ هڪ ڪاڏي جو آهورو رکبو، ٻن جانورن جي وچ ۾ هڪ پاڻي جو آهورو رکبو جيئن تصوير نمبر 5 ۾ ڏيکاريو ويو آهي. ڪير وارن جانورن کي ٻڌڻ لاءِ بهتر آهي ته ڳچي، اڳين ٽنگ يا مُڇي طريقي سان ٻڌجي اهو طريقو ڪير ڏهڻ لاءِ يا خوراڪ ڏيڻ لاءِ آسان آهي.

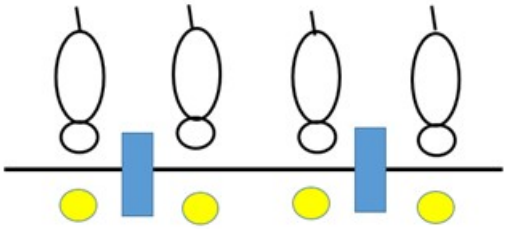


Figure 3-11 Tying in a line for four animals

Photo 3-47 Water trough for free access to water

Photo 3-48 Bricks should be placed between concrete slabs

2) جسر جا ٻڌڻ وارا حصا

الف) ڳچي ۽ مڇي:- ڳچي ۽ مڇي طريقو جانور کي گهٽ بيچيني/ دٻاءُ ۾ رکي ٿو. ان طريقي سان جانور کي آساني سان خوراڪ ۽ پاڻي ڏئي سگهون ٿا. اها پڻ جانور کي هڪٻئي کان وڌهڻ کان بچائي ٿي. نوڙي يا زنجير ڪاڏي جي آهوري يا پلر سان مضبوطي سان ٻڌل هجي. هڪ ننڍي ڪِلي سان ٻڌڻ صحيح نه آهي ڇو ته اهو زمين مان آساني سان نڪري ايندو. رسي (نوڙي) ايتري ڊگهي هجي جو جانور آساني سان آهوري مان کائي پيئي سگهي.

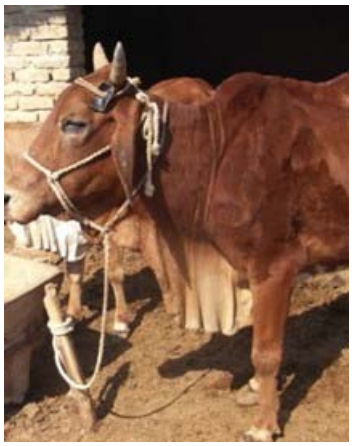
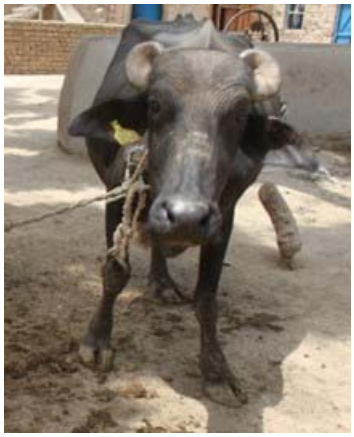
	

Photo 3-49 Tying with brindle	Photo 3-50 Typing at neck

3.3.6 چرائي

جانور کي چرائي تي موڪلڻ سان ڪيترائي فائدا آهن. جيئن ننڍن جانورن جي سڌي طرح سان واڌويجهه ٿيندي، وهر جي ٻه خبر پوندي ۽ گاهه ڪري اڇڻ جو بوجهه ٻه گهٽ ٿيندو. ان سان گڏوگڏ چرائي تي ويل جانور ڪيترن ئي قسمن جا گاهه کائي ٿو. جنهن جنهن ۾ نمڪياتي جزا موجود هوندا آهن پر جيڪو گاهه اسان ٻڌل جانور کي ڏيون ٿا ان ۾ اهي جزا گهٽ هوندا آهن. ڪير واري جانور کي گرمي وارن ڏينهن ۾ پري چرائي تي موڪلڻ بهتر نه ٿيندو يا جتي گاهه گهٽ هجن اهڙين صورتن ۾ ڪير واري جانور کي چرائي تي موڪلڻ سان ان جي طاقت سگهه گهٽ ٿي ويندي ۽ ان جي ڪري ڪير جي پيداوار گهٽ ٿي ويندي.

ڪجهه پاڳيا جانور کي هڪ ڪلاڪ جي پري پنڌ تي چرائي لاءِ وڻي ويندا آهن، 30 منٽن کان وڌيڪ غير ضروري پنڌ جانور جي ضروري طاقت ختم ڪري ڇڏيندو، خاص طور تي ڪير وارن جانورن جي. جڏهن جانور چرائي تي ويندو جتي گاهن جي موجودگي وڌيڪ هوندي اتي جانور آرام سان گاهه کائيندو ۽ اوڳر ورائيندو. جتي گاهن جي گهٽ موجودگي هوندي ان صورت ۾ جانور وڌيڪ پنڌ ڪندو گاهه ڳولهيندو ۽ گهٽ کائيندو ان نتيجي ۾ جانور جي جسماني طاقت وڌيڪ ضايع ٿيندي.

		
Photo 3-53 Walk in a long distance will cause energy loss	Photo 3-54 Insufficient fodder in a grazing field	Photo 3-55 Grazing in post-harvest cotton field

3.3.7 ڪُر ڪنٽرائٽ

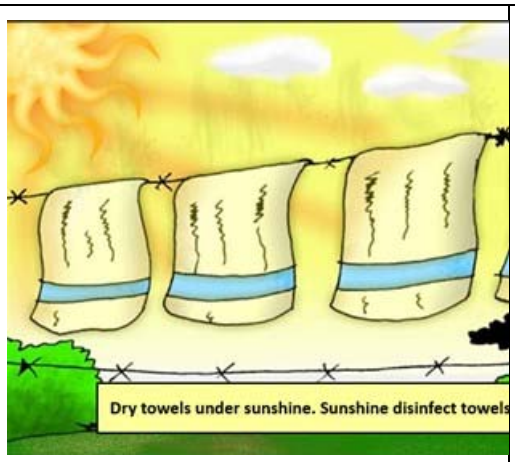
مينهن/ ڳئون جا ڪُر هڪجهڙا هوندا آهن. تڏهن انهن جي سارسنيال ٻه هڪجهڙي ٿيندي آهي. جيڪڏهن ڳئون ڏينهن ۾ 8 ڪلاڪ چرائي لاءِ وڃي ٿي ته ان جي ڪُر قدرتي طور تي گسي ويندا آهن ۽ هميشه ساڳئي حالت ۾ هوندا آهن. ان صورت ۾ ڪُر ڪنٽرائٽ ضروري نه آهن. ڪُر هڪ مهيني ۾ 5 ملي ميٽر وڌن ٿا پر هر نسل ۽ سارسنيال جي ڪري ٿورو فرق

آهي. مهيني ۾ 5 ملي ميٽر وڌڻ جي صورت ۾ هڪ سال ۾ ڪُر 6 سينٽي ميٽر وڌندا. جيڪڏهن جانور چرائي تي نڪو وجي يا گهٽ وجي ٿو تہ ان جا ڪُر هيٺ ڏنل تصوير وانگر ٿي ويندا. جانور پنهنجي جسم جو سڄو وزن 4 ٽنگن تي کڻي ٿو. تنهن ڪري وڌا ڪُر جانور کي بي سڪوني ڪن ٿا ۽ جانور جي جسم تي بوجھ ٿئي ٿو ۽ ڪڏهن ڪڏهن وڌن ڪُرن جي جانور کي هڏن جي بيماري يا جانور منڊو ٿي پوندو آهي. وڌن ڪُرن جي ڪري جانور جي کير جي پيداوار پڻ گهٽجي ويندي آهي. تنهن لاءِ ڪُر ڪٽرائڻ تمام ضروري هوندا آهن. جيڪڏهن جانور چرائي لاءِ تمام گهٽ وجي ٿو تہ هر 6 مهيني ان جانور جا ڪُر ڪنهن ماهر ڪُر ڪٽرائڻ واري کان ڪُر ڪٽرائجن.

Photo 3-56 Hoof-cutting by a technician

Photo 3-57 Comparison before and after hoof-cutting

3.3.8 ڏهائي جو صحيح طريقو:

	
چار ليٽر پاڻي ۾ 2 سيسي ڪلورين جا وجهو پوءِ ان ۾ هڪ ٽوال جو ٽڪرو وجهو ۽ سڀني نموني نپوڙي ڪيو.	هاڻي ڏهائي شروع ڪيو
	
ڦر کي ماڻُ ڏي ڇڏيو ته اهو کير پيئي، ان سان جانور جا کير وارا غدود حرڪت ۾ ايندا. ان کانپوءِ تيار ٿيل ٽوال جي ٽڪري سان ٿڻن کي صاف ڪيو. جيڪڏهن ٿڻن تي مٽي لڳل آهي ته انهن کي پهريان پاڻي سان ڏوئي ٽوال سان خشڪ ڪيو.	هر جانور لاءِ الڳ ٽوال رکو ۽ هر جانور جي ڏهائي کانپوءِ هٿ ڏوئي ٻئي جانور جي ڏهائي ڪيو.
	
کير جي ڏهائي ختم ٿيڻ کانپوءِ ٽوال ۽ کير جا ٽانو صابڻ سان ڏوئي ڇڏيو	ٽوال کي اس تي سڪايو اُس جي روشني سان ٽوال تي موجود سڀ جراثيم مري ويندا آهن

3.3.9 ڪنڊي مينهن جي جسماني حالت جي ڳڻپ (سنڌ جي بهراڙي جي چوپائي مال جي پائيدار ترقي وارو منصوبو)

اچو ته جانور جي جسم جي 5 حالتن جي باري ۾ سکون. جانور جي جسماني حالت مختلف عرصن دوران تبديل ٿيندي رهندي آهي. جيئن پهرين کير واري عرصي دوران، عروج تي کير جي عرصي دوران يا وري آخري کير جو عرصو دوران جڏهن خشڪ ٿيڻ واري هوندي آهي. نارمل جسماني حالت جي ڳڻپ 2.5 کان 3.5 جي وچ ۾ هوندي آهي. 2.5 کان گهٽ وزن يا ڪمزور جانور ليکيو ويندو آهي. ان جانور کي واڌاري خوراڪ جي ضرورت هوندي آهي. 3.5 کان وڌيڪ جسماني حالت جي ڳڻپ وارو جانور ٿلهو يا گهٽي وزن واو ليکيو ويندو آهي. ان جي خوراڪ کي گهٽائڻ گهرجي. گهٽي ٿلهي جانور هجڻ سان ان جي کير جي پيداوار تي اثر پوندو ۽ قرجڻ ۾ به مسئلو ٿي سگهي ٿو.

مينهن ۽ ڳئون ۾ جسماني حالت جي ڳڻپ جو دارومدا جانور جي کاڌخوراڪ ۽ توليدي تي آهي ۽ ڪجهه مختلف شعبن تي استعمال ٿي سگهي ٿي.

جسماني حالت جي ڳڻپ جسم جي چربي جي جمع ٿيل چربي کي نمبرن سان سجاتو وجي ٿو. بي سي اسي ڏسڻ سان ۽ هٿ لڳائڻ سان آساني سان سجاتو وجي ٿو. اچو ته بي سي ايس سکون.

عام طور تي بي سي ايس ڪمزور 2.0، نارمل 3.0، ٿلهو 4.0 آهي. بي سي ايس نمبر ڪنڊي مينهن لاءِ ايجاد ڪيا ويا آهن. جڏهن ته اهي بي سي ايس زيبو ڳئون ۽ مڪس زيبو ڳئون ۽ يورپين ڳئون تي پڻ استعمال ٿين ٿا.

1. **جسماني حالت جي ڳڻپ جو اندازو ڪيئن لڳائجي.**

1) بنيادي طرح جي جسماني حالت جي ڳڻپ ڪابي پاسي کي ڏسڻ ۽ هٿ لڳائڻ سان ڪري سگهجي ٿي، جو جو ڪابي پاسي واري چمڙي لڙڪيل ۽ ڊري هوندي آهي.

2) جسماني حالت جي ڳڻپ جو اندازو 0.5 وڌڻ سان لڳائي سگهجي ٿو. جيئن 2.0، 2.5، 3.0، 3.5 ۽ 4.0 اهو خالص 0.25 وڌي ٿو پر 0.5 آسان واڌارو آهي اسان کي پنهنجو مقصد حاصل ڪرڻ لاءِ.

3) ڏسڻ ۽ هٿ لڳائي جانچڻ.

پهريان ڏڏ ۽ ڊاڪ واري هڏي تي هٿ لائي چڪاسڻ گهرجي ته اتي چربي آهي يا نه. ان کانپوءِ ڪڪ وٽ پاسراتين وارن حصن ۽ ڪرنگهي واري جي ٻنهي پاسن ۽ ڏڏ واري هڏين جي وچ واري حصي کي ڏسي جانچ ڪجي جيڪڏهن اتي چربي موجود نه آهي ته اهو ڏسو ته هڏن جو لائينون ظاهر ٿيون يا نه، جيڪڏهن هڏين تي چربي جمع ٿيل هوندي ته اسان کي هڏيون نظر نه ايندیون، چربي جي موجودگيءَ جي ڪري اتي گولائي هوندي . چربي جي موجودگي جي صورت ۾ توهان کي اتي هٿ لڳائڻ سان لچڪدار کل محسوس ٿيندي، جڏهن توهان پڇ جي پاڙ کي دٻائيندو.

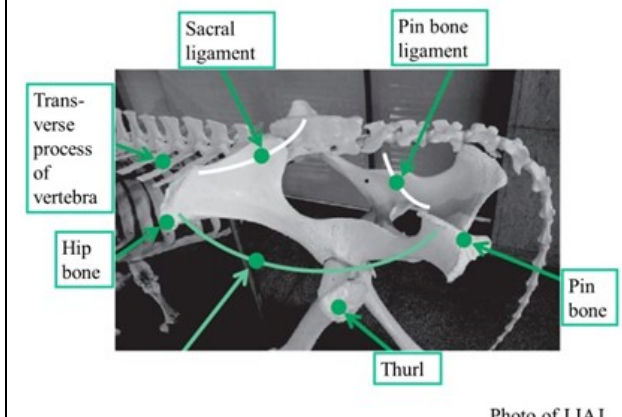


Photo 3-58 Skelton of cow is used for BCS determination

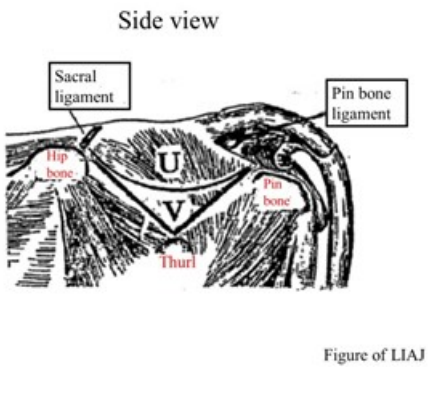


Figure 3-21 Rear body of buffalo is used for BCS

	determination

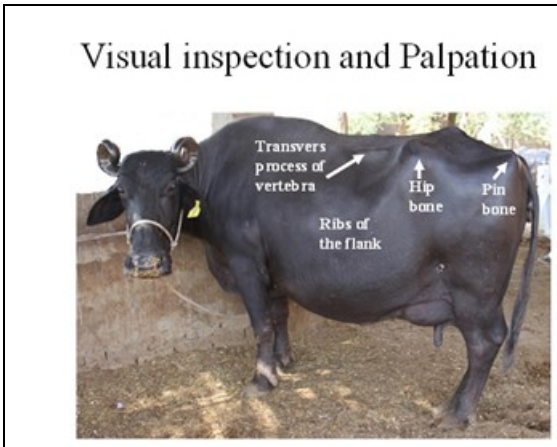
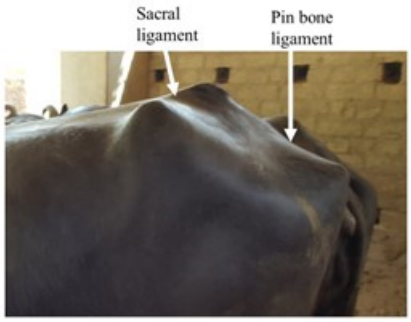
	

Photo 3-59 Check points for BCS determination	Photo 3-60 Ligaments are used for BCS determination

	
Photo 3-61 Very weak; Under the tail is deeply indented	Photo 3-62 Fatty; Fat accumulation is recognized under the tail and side of the body

Photo 3-63 It is dented in a finger

4) جسماني حالت جي ڪٽپ جو اندازو لڳائڻ.
(جسماني طبعي حالت 3.0)

جيڪڏهن جانور جي ڏُڏ ۽ ڏاڪ واري هڏين تي چربي جي موجودگي هجي پوءِ پلي اها گهٽ هجي. ان جانور کي جسماني طبعي حالت 3.0 ڏيندا سين. جڏهن ته ڪُک، پاسراٽين،ڪرنگهي واري ۽ ڏُڏ واري هڏين جو ڏسڻ سان اندازو لڳائي سگهجي ٿو. جسماني طبعي حالت نمبر 3.0 نارمل کاڌخوراڪ جي حالت ظاهر ڪري ٿي، جيڪڏهن جسماني طبعي حالت 3.0 کان گهٽ هجي ته ان صورت ۾ توهان پاسراٽين وارين هڏين جو جائزو ونو، جيڪڏهن جسماني طبعي حالت 3.0 کان مٿي هجي ته ان صورت ۾ پاسراٽين، ڪرنگهي واري هڏين ۽ ڏُڏ واري هڏين جو جائزو ونو.

(جسماني طبعي حالت 3.5)

جيڪڏهن ڏُڏ واري هڏي ۽ ڏاڪ واري کل جي اندران ٿورڙي چربي ۽ ماس جو تهه نظر اچي ته اها جسماني طبعي حالت جو انگ 3.0 آهي. جيڪڏهن توهان کي پاسراٽين جي هڏين جون لائين صاف ظاهر نه اچن (ڪمزور) اصل شڪل سجاڻي سگهو، ڏُڏ واري هڏي ٿوري گولائي سان هجي ته ان جانور جي جسماني طبعي حالت 3.5 ٿيندي.

(جسماني طبعي حالت 4.0)

جڏهن کل جي هيٺان ڏُڏ ۽ ڏاڪ واري هڏي تي چربي موجود هجي، پاسراٽين جون هڏيون بلڪل نظر نه اچن ۽ ڪرنگهي واري هڏي، سيڪرل لنگامينٽ ۽ ڏُڏ واريون هڏيون گولائي واري شڪل ۾ هجن ته ان جسماني طبعي حالت کي 4.0 نمبر ڏيندا سين، جيڪڏهن توهان پڇ جي پاڙ هيٺان زور ڏيندو ته توهان کي لچڪدار چمڙي محسوس ٿيندي جو ته اتي چربي جي موجودگيءَ هوندي آهي.

(جسماني طبعي حالت 2.5)

جيڪڏهن کل جي هيٺان ڏاڪ واري هڏي تي چربي جو ڪو تهه نه هجي پر ڏُڏ واري هڏي تي ٿورو چربي جو ٿورو تهه هجي ته ان کي 2.5 نمبر ڏيندا سين. جيڪڏهن کل جي هيٺان ڏاڪ ۽ ڏُڏ واري هڏي تي ٿورو چربي هجي ته ان کي 3.0 نمبر ڏيندا سين، پر جيڪڏهن کل جي هيٺان ڏُڏ ۽ ڏاڪ وارين هڏين تي چربي جو ڪو تهه نه هجي ته ان کي 2.0 نمبر ڏيندا سين ، پر جيڪڏهن پاسراٽيون، ڪرنگهي واري هڏي، ڪڪ ۽ ڏُڏ واريون هڏيون ٿورو گولائي ۾ نظر اچن ته ان کي 2.5 نمبر ڏيندا سين. پر جيڪڏهن پاسراٽيون، ڪرنگهي واري هڏي، ڪڪ ۽ ڏُڏ واريون هڏيون ٿورو گولائي ۾ نظر اچن ته ان کي 2.5 نمبر ڏيندا سين.

(جسماني طبعي حالت 2.0)

جيڪڏهن ڏُڏ واري هڏي ۽ ڏاڪ واري هڏي تي چربي جو ڪو تهه نظر نه اچي ۽ پاسراٽيون، ڪرنگهي واري هڏي، ڪڪ واري هڏي ۽ ڏُڏ واري هڏي واضح ظاهر ٿين ته ان کي 2.0 نمبر ڏيندا سين.

4) جسماني طبعي حالت هر کير واري عرصي لاءِ

هر کير ڏيندڙ جانور جي ويم دوران جسماني طبعي حالت جي ماپ 3.5 هوندي آهي ۽ جڏهن پرپور کير تي هوندي آهي 3.0 جسماني طبعي حالت تي هوندي آهي. آخري کير ڏيڻ وارو عرصو جڏهن مينهن خشڪ ٿيڻ واري هوندي آهي تڏهن جسماني طبعي حالت 3.5 هوندي.

Table3-8 BCS for each lactation period

BCS each period

Period	Average
Cows at calving	3.5
Peak of lactation (50 ～60 days)	3.0
Mid lactation (100 ～200 days)	3.25
Late lactation (200 ～305 days)	3.5
Dry period	3.5

(3) Photos in different level of BCS

Photo 3-64 BCS 2.0

Photo 3-65 BCS 2.5Side View

Photo 3-66 BCS 2.5Rear view

	
Photo 3-67 BCS 3.0	Photo3-68 BCS 3.5

	
Photo 3-69 BCS more than 4.0, Side view	Photo 3-70 BCS more than 4.0, Rear view

باب چوٿون ڦرن کي ڪيئن پالجي

4.1 اچو ته اهي ڦر پاليون جنهن کي وڌيڪ بک لڳندي هجي.

اهي ڦر پالجن جن کي وڌيڪ بک لڳندي هجي اهي جلدي جوان ٿي وڌي مينهون ٿي ويندیون.
هڪ سٽي بک رکندڙ ٽيهاڙ جيڪا گهٽو کائيندي هجي، وڌو اوجهه ۽ صحت مند جسم رکندڙ هجي. ان ۾ ڪو به شڪ نه آهي ته اهڙيون ٽيهاڙيون اڳتي هلي سٽي ڪير جي پيداوار ڏينديون. ڪير جي سٽي پيداوار ڏيڍ سان گڏوگڏ اهي ٽيهاڙيون وڌيڪ ڏيکيون ٽيندیون ۽ پنهنجي زندگيءَ ۾ گهٽي عرصي تائين ڪير ڏينديون.
هڪ جوان مينهن جي ڪير ڏيڍ جي صلاحيت ننڍن ڦرن جي شروعاتي وقت جي سارسنيال ڪير پيئڻ ۽ ڪير ڇڏائڻ واري عرصي تي منحصر آهي.

4.2 وڏن جانورن جو هاضمي جو نظام

وڏا جانور جيئن مينهن ۽ ڏڳي جي هاضمي جي نظام جا 4 حصا ٿين ٿا.

وڏن جانورن جي هاضمي جو نظام 4 حصن تي مشتمل آهي. 1) ريومن، 2) ريٽيڪيولم، 3) اوميزم ۽ 4) ايبوميزم. ايبوميزم جو ڪم انسان جي هاضمي جي نظام جهڙو آهي. هڪ جوان جانور جو اوجهه ۾ هزارين بيڪٽيريا ۽ پروٽوزووا هوندا آهن. اهي بيڪٽيريا ۽ پروٽوزووا کاڌي کي ننڍن حصن ۾ ڀڃ ڊاهه ڪن ٿا. ريومين جانور جي هاضمي جي نظام جو سڀ کان وڏو حصو آهي. ريومين 80فيصد جڳهه والاري ٿو هاضمي جي. ننڍي ڇاول ڦر جو ريومين 30فيصد جڳهه والاري ٿو ان لاءِ ضروري آهي ته ڦر جلدي وڏا ٿين ته جيئن انهن جو ريومين به وڌي جيڪو انهن جي شروعاتي عمر ۾ وڏڻ شروع ٿئي ٿو.

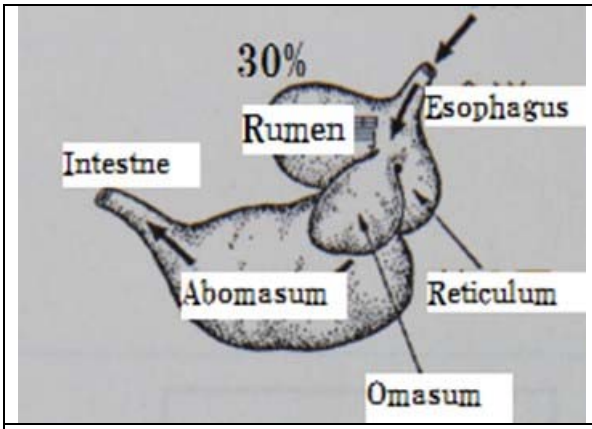


Figure 4-1 Stomach of a calf (Rumen occupies 30% of stomach)

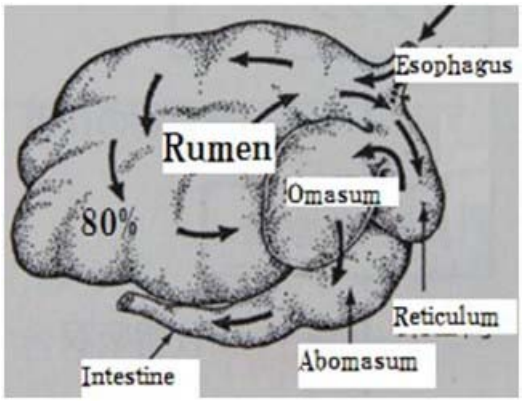


Figure 4-2 Stomach of an adult buffalo (Rumen occupies 80% of stomach)

4.3. ڦرن جو ريومين ڪيئن وڌندو آهي.

4.3.1 اچو ته ڪوشش ڪيون ته ڦرن جو ريومين وڌي.

هن حصي ۾ بڌايو ويو آهي ته ڦرن جو ريومين ڪيئن وڌندو آهي.
1) ڦرن جي جمڻ جي 2 هفتن ڪانپوءِ سٽي معيار جا ساوا گاهه کارائڻ شروع ڪيو.

سنو سائو گاھ جيڪو ريومين کي وڌڻ ۾ مدد ڏئي ٿو. شروع ۾ ڦر تمام گھٽ سائو کائيندا آھن. پر اڳتي هلي اُهي آهستي آهستي سني مقدار ۾ کائڻ لڳندا آھن.

2) سانڍيل گاھ کارائڻ

ڦرن جو ريومين ننڍو ٿيندو آهي. ساون گاھن ۾ پاڻي جي مقدار 70فيصد هوندي آهي. جڏهن ڦر سائو گاھ کائيندا آھن تہ انهن جو ريومين پاڻي سان پرجي ويندو آهي. ساوا گاھ کائڻ جي ڪري ڦرن کي وڌيڪ ٻئي ڪنهن خوراڪ جي ضرورت نہ هوندي آهي. سانڍيل گاھ ساون گاھن جو متبادل هوندو آهي. سانڍيل گاھ ڦرن کي نہ صرف ضرورت مطابق طاقت ڏين ٿا ان سان گڏ دستن کان پڻ بچائين ٿا. دست ڦرن ۾ عام بيماري آهي.

4.3.2 ڪهڙي طريقي سان سنو سانڍيل گاھ ناهي سگهجي ٿو.

سڪل گاھ ساون گاھن مان نهي ٿو جنهن جو پاڻي سُڪائي 15 فيصد تائين بچائبو آهي. سانڍيل گاھ جانور جي انزائيم ۽ جيوڙن جي حالت کي بهتر ڪندو آهي. تنهن لاءِ سُڪل گاھ کي محفوظ ڪري رکو تہ ان جو معيار بہ وڌيڪ عرصي لاءِ خراب نہ ٿيندو. جنگلي گاھ ۽ گرامائن گاھ جيئن سانڍيل گاھ ناھڻ لاءِ بهتر نہ هوندا آھن. جوئر ۽ مڪئي ڦرن لاءِ بهتر نہ هوندا آھن ڇو جو اهي سخت ٿين ٿا.

سنڌ صوبي ۾ اُس جي روشني وڌيڪ تيز هوندي آهي. ڇبر کي هڪ کان ڏيڍ ڏينهن اُس جي روشني تي سُڪائيندا سين تہ سانڍيل گاھ تيار ٿي ويندو. گاھ کي صبح جي ٿائيم تي ڪٽيو ۽ اُس هينان رکي ڇڏيو ۽ هر 2 ڪلاڪن ڪانپوءِ گاھ جو پاسو مٽايو (اٿلايو) ۽ گهم کان بچائڻ لاءِ گاھ کي رات جو ڍڪي ڇڏيو، جيڪڏهن توهان وٽ پلاسٽڪ جي شيٽ آهي تہ ان سان گاھ کي ڍڪي ڇڏيو. ٻئي ڏينهن صبح جو جڏهن اُس نڪري تہ گاھ کي ڦهلائي ڇڏيو ۽ هر ڪجهہ ڪلاڪن ڪانپوءِ گاھ کي اٿلايو. ٻئي ڏينهن جي شام تائين سانڍيل گاھ تيار ٿي ويندو. 5 ڪلوگرام سائي گاھ مان 1 ڪلوگرام سانڍيل گاھ تيار ٿيندو آهي.

4.3.3 ڦرن کي سني معيار وارو سانڍيل گاھ سني مقدار ۾ کارائڻ

ڦرن کي 8 مهينن تائين سانڍيل گاھ کارائڻ جي صلاح ڏني وئي آهي. جتان پاڻي جو وهڪرو هوندو آهي. ان زمين تي جنگلي ساوا گاھ سڄو سال موجود هوندا آھن.

جوان جانور وڌيڪ مقدار ۾ ساوا گاھ کائي تو جڏهن تہ 6 مهينن جي ڦر جي گهرج گھٽ هوندي آهي. تنهنڪري اسان کي وڌيڪ اهميت ڦرن کي ڏيڻ گهرجي. جنگلي گاھ وڌيڪ ٽائيم تائين محفوظ ڪري سگهجن ٿا. تنهن لاءِ اها صلاح ڏجي ٿي تہ جيترو وڌيڪ ٿي سگهي سائو گاھ پٽيو ۽ ان کي سانڍيل گاھ جي صورت ۾ محفوظ ڪري ڦرن کي ڏيو.

	
Photo 4-1 Chabbar which is widely available in the area	Photo 4-2 Technical guidance on hay preparation

Photo 4-3 Calves are delighted to eat hay

4.4 ويم جي دوران مينهن/ ڪُئون جي سارسنيال

جڏهن هڪ مينهن/ ڪُئون ويم جي ويجهو ايندي آهي تہ اها بيچيني واري حالت هوندي آهي. صحيح طرح سان ويم ڪرائڻ لاءِ توهان پنهنجي جانور کي پنهنجي ويجهو واري جڳهہ تي رکو ۽ ان کي هروقت ڏسندا رهو.

ان سان گڏوگڏ توهان هڪ سني جانور جي ڊاڪٽر سان رابطي ۾ رهو تہ جيئن مشڪل وقت ۾ مثالطور ڏکئي ويم جي صورت ۾ هٿ وجهڻ کان پهريان ڊاڪٽر کان مشورو ڪيو. رات جي وقت ويم جي صورت ۾ جيترو ٿي سگهي جانور جي مدد ڪيو تہ جيئن ڪنهن اٽوٽندڙ واقعي کان بچي سگهجي.

4.5. ڦر جي سارسنيال ان جي جمڻ وقت

ڦر جي جمڻ وقت پهريان اپاءُ ورتا وجن تہ جيئن اهو صحتمند ٿي سگهي.

1) ڦرن جي جسر کي خشڪ ڪرڻ

ڦر کي جمڻ کان پوءِ ماءُ وٽ ڇڏيو تہ جيئن اها ان کي چٽي صاف ڪري. ڦر کي چٽڻ سان ماءُ جا غدود تحرڪ ۾ ايندا آهن ۽ ان سان گڏوگڏ جر نڪرڻ ۾ بہ آساني ٿيندي آهي.

2) دن کي جراثيمن کان پاڪ ڪرڻ

دُن کي 10 فيصد آيوڊين ٽنڪچر سوليوشن سان صاف ڪيو يا وري آيوڊين سوليوشن جي سُئي دُن ۾ لڳايو.

Photo 4-4 The umbilical cord should be disinfected by dipping into. Iodine Tincture solution

3) ماس ۾ اينٽي بايوٽڪ جي سُئي لڳائڻ

اينٽي بايوٽڪ جي سُئي جميل ڦرن کي ان صورت ۾ لڳائڻ لاءِ چيو ويو آهي جنهن تي ڦرن کي گهٽي بيماري ٿيندي هجي گهم وارو موسم، مينهن کانپوءِ وارو موسم ۽ سردين واري موسم ۾ خاص طور تي 3 ملي ليٽر اوٽي سي ايل اينٽي بائيوٽڪ سئي ماس ۾ لڳائجي.

4) ڦرن جي پالڻ جي جڳهه

ڦرن کي خشڪ صاف جڳهه تي رکجي. گرمين جي موسم ۾ ڦرن کي پالڻ لاءِ اهڙي جڳهه چونڊيو جيڪا سني هوادار ۽ ڏکيل هجي. سردين جي موسم ۾ واڙي جي فرش تي پلال وڇائي ڇڏيو ۽ ڦرن کي تيز هوا کان بچايو. ڦرن جي پالڻ واري جڳهه کي روزانو صاف ڪجي.

5) ڪير پيئندڙ ڦرن جي سارسنيال

هڪ دفعو جيڪڏهن ڪير پيئندڙ ڦر بيمار ٿي پيا تہ انهن جي حالت جلدي ۽ آساني سان خراب ٿي ويندي. توهان پنهنجي ڦر جي هر وقت سارسنيال ڪندا رهو. جيڪڏهن ڦرن جون اکيون چمڪندڙ آهن ۽ هو تڪڙو گهمي ڦري ٿو ۽ ان جي پويون حصو صاف ستڙو آهي ميرو نہ آهي تہ اهو صحتمند هوندو. اها توهان پنهنجي عادت ناهي ڇڏيو تہ پنهنجي ڦر جي هر وقت سارسنيال ڪجي جيئن وات، نڪ، اکين مان نڪرندڙ مادن جي رنگ جي، ساهه ڪٽڻ جي ٽائيم جي بخار هجڻ يا نہ هجڻ جي ۽ دستن جي هجڻ جي خبر هجي.

6) پس

ڦرن کي جمڻ جي 6 ڪلاڪن اندر پس پيارجي.

اهو ضروري آهي تہ ڦر کي پس وڌيڪ اثر واري هوندي آهي ڇوجو ان ۾ تمام وڌيڪ گاماگلوبلين هوندو آهي. پهريون پس ويمر جي 3 ڪلاڪن جي اندر پيارڻ گهرجي ۽ ٻيو پس ويم جي 6 ڪلاڪن اندر پيارجي. اهو بهتر پهريون پس ويم جي 3 ڪلاڪن جي اندر پيارڻ گهرجي ۽ ٻيو پس ويم جي 6 ڪلاڪن اندر پيارجي، اهو بهتر آهي تہ ڦر کي جيترو پس پيارجي.

ڇو تہ ڦر جي جمڻ جي 6 ڪلاڪن ڪانپوءِ پس ۾ موجود گاماگلوبلن جسم ۾ جذب نہ ڪري ٿيندو آهي. ويامڻ جي 5-3 ڏينهن تائين ڪير يا پس نہ کپائجي ڇو تہ ان ۾ عام ڪير جي مقابلي ۾ غذائي جزا وڌيڪ هوندا آهن. جيترو وڌيڪ ٿي سگهي ڦرن کي پس پيارجي.

4.9. ڦر جي خوراڪ جي حالت جي حساب سان نمبر ڏيڻ

اچو تہ ڦرن جون چار غذائي حالتون ڏسون

نمبر 4: ٿلهو (چربي): اهڙو جانور صحتمند ڏسجڻ ۾ ايندو ۽ ان جو سڄو جسم چربي سان ڀريل هوندو. ڏاڪ واري هڏي يا پاسراٽيون واضح ظاهر ٿيندیون. وڌيڪ چربي واري قر کي آساني سان اندروني مسئلا ٿيندا آهن. تنهن لاءِ ضروري آهي ته خوراڪ جو مقدار گهٽايو ته جيئن جانور جومناسب وزن ٿي سگهي.

نمبر 3: وچولو: پوري ساري خوراڪ واري حالت

نمبر 2: ٿورو سنهو: پنهنجي قر کي ڏيان سان ڏسو ۽ شامل ڪيو ڪجهه داڻيدار خوراڪ ۽ فارمولا خوراڪ جيڪڏهن ضرورت هجي ته.

نمبر1: تمام سنهو: ڏسو ته چا توهان جي قر کي بيماري آهي ۽ ان جي ضرورت مطابق علاج ڪرايو ۽ پيٽ جي ڪيڙن واري دوا پياريو ان کانپوءِ ڪجهه داڻيدار خوراڪ ۽ فارمولا خوراڪ کارايو.

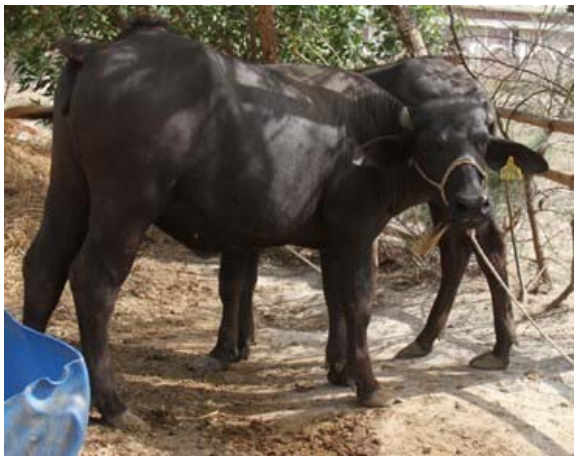


Photo 4-10 Level 4: Fatty

Photo 4-11 Level 3: Normal

Photo 4-12 Level 2: Slightly weak

Photo 4-13 Level1: Very weak

4.10. قرن کي گرمي کان بچاءُ لاءِ احتياطي اپاءُ

قرن کي گرمي کان بچائڻ لاءِ احتياطي اپاءُ وٺڻ تمام ضروري آهي.

قرن کي 6 مهينن جي عمر کان وهنجارڻ شروع ڪجي. موسم ۾ گرمي کان بچائڻ لاءِ احتياطي اپاءُ ضروري هوندا آهن، قرن لاءِ هوادار ۽ ڊيڪيل جڳهه هجي. پاڻي جي چٽڪار ڪيو ته جيئن هوا ۾ گرمي جو گهٽ هجي، وڌيڪ گرمي وارن ڪلاڪن ۾ قرن جي جسم تي هر 30 منٽن کانپوءِ پاڻي جو ڦوهارو ڪيو ان سان قرن جي جسماني گرمائش گهٽجي.

Photo 4-15 Sprinkling water over calves with knapsack type spray

4.9 ڦرن کي دستن کان بچائڻ لاءِ احتياطي اُپاءُ

ڦرن کي دستن ٿيڻ جا ٻه سبب ٿيندا آهن.
1) پهريون خراب ٿيل خوراڪ جو کائڻ ۽ ٻيو وڇڙندڙ بيمارين جي جراثيمن جهڙوڪ بيڪٽيريا، وائرس ۽ مفت خور ڪيڙن جو جسم ۾ داخل ٿيڻ.
2) وڇڙندڙ بيمارين جي جراثيمن جهڙوڪ بيڪٽيريا، وائرس ۽ مفت خور ڪيڙن جو جسم ۾ داخل ٿيڻ.
ڦرن ۾ دستن جي تشخيص، علاج ۽ ٻيا بچاءُ جا طريقا هيٺ بيان ڪجن ٿا.

1 . ڦرن ۾ عام طور تي ٿيندڙ دست جيڪي ڏينهن ۾ صرف هڪ دفعو ٿيندا هجن ان صورت ۾ علاج جي ڪابه ضرورت نه هوندي آهي جنهن جي ڪيفيت هيٺ بيان ڪجي ٿي.

1) ڦر عموماً ڏينهن ۾ هڪ دفعو دست ڪندو آهي.
2) دستن جو رنگ اڇو يا هيڊو هوندو آهي.
3) ڦر گهمڻ دوران پڇ متي ڪري هلندو آهي.

2 . جيڪڏهن ڦر سست هجي ته هيٺين ڳالهين تي ڌيان ڏين گهرجي.

1) جسم جي پاڻيائ جانچڻ

ان جي لاءِ ڪنڌ واري کي پڪڙي چڪي ڏسجي جيڪڏهن کل چڪجي بيهي رهي ۽ ان ۾ لچڪ نه هجي ۽ ان سان گڏ اکيون اندر گهڙي وين هجن ته اهي جسم جي پاڻيائ گهٽجڻ جون واضع نشانيون آهن.

2) جسماني بخار جانچڻ

عموماً ڦرن جي جسماني گرمي جو درجو وڌن جانورن کان مختلف ۽ وڌيڪ ٿئي ٿو. صحتمند ڦر جو عام حالت ۾ بخا 101.5-102ºF (38.1-39.2ºC) هوندو آهي. جيڪڏهن ان حد کان وڌيڪ هجي ته سمجهو ته ڦر بيمار آهي.

3 . جسماني پاڻيائ جي گهٽتائي جو علاج

اهو تمام ضروري آهي ته ڦرن ۾ جسماني پاڻيائ جو تناسب صحيح هجڻ گهرجي. دستن هجڻ جي باوجود جيڪڏهن ڦر ڏسجڻ ۾ سگهو متارو هجي ته انکي صرف جسماني نمڪيات پوري ڪرڻ لاءِ او

آر ايس (ORS) پاڻي ۾ملائي جيترو جلد ٿي سگهي پيارجي، جيڪڏهن جانور بلڪل سست هجي ته انکي (رنگر ساليوشن يا نارمل سيلائن) جي ٽيلهي ڊاڪٽر جي هدايت مطابق لڳرائجي.

4 . **جراثيمن وسيلي ٿيندڙ دستن ۽ بخار جو علاج**

جراثيمن وسيلي ٿيندڙ دستن ۽ بخار جو علاج جراثيم ڪش دوائن سان مهيا ڪرڻ گهرجي.

5 . **قرن جي مناسب سارسنڀال جا طريقا**

1) بيمار قر کي صحتمند قرن کان الڳ رکيو وڃي.
2) قرن جي وهڻ ۽ سمهڻ واري جڳهه صاف ۽ خشڪ هجي.
3) وٽاڻ جو فرش، استعمال ٿيندڙ ٽانو، رسا ۽ حفاظتي ڄاري جراثيم ڪش دوا سان چڱي طرح صاف ڪرڻ گهرجن.

جيڪڏهن قر دستن جي ڪري بيمار ٿي پئي ته ان جي شدت جو اندازو هن طرح سان لڳائي سگهجي ٿو.

دستن جي شدت ٽن ڪيفيتن ۾ ورهائي وئي آهي.

پهرين قسم جي ڪيفيت ۾ دستن سان گڏ رت پڻ شامل هوندو آهي. انسان گڏوگڏ چيٽي جو رنگ ڪارو هوندو آهي. ان قسم جي دستن مان انديشو ڪري سگهجي ٿو ته اهو قر (ڪاڪسڊيوسس) جراثيم جي ڪري بيمار آهي.

ٻئي قسم جا دست پاڻياڻ وانگر هوندا آهن. انهن جو نمونو صرف يا صابڻ جي گج وانگر هوندو آهي. جنهن ڪري فرش تي ڪرڻ سان ڦهلبا نه آهن.

ٽئين قسم جا دست وڏيڪ پاڻياڻ جهڙا هوندا آهن پر انهن جي حالت ٻئي قسم جي دستن کان وڏيڪ بهتر هوندي آهي. ان قسم جا دست پڪي زمين تي ڪرڻ سان ڦهلجي ويندا آهن.

هر هڪ قسم جي دستن کي وري ٻن ڪيفيتن ۾ ورهايو ويو آهي. هر وقت قر جي حالت جانچڻ گهرجي جيڪڏهن انهن کي دست ظاهر ٿين ته انهن جو علاج مناسب طريقي سان ڪرڻ گهرجي قرن جي صحت عمومَا جلدي خراب ٿي ويندي آهي. جنهن لاءِ انهن جو ترت علاج تمام ضروري هوندو آهي. ڪجهه ضروري دوائون جيڪي آنڊن ۽ معدي جي خرابي لاءِ استعمال ٿيندڙ هجن ۽ دستن کي بند ڪرڻ لاءِ استعمال ٿين جهڙوڪ او آر ايس (ORS) ، اينٽي بائيوٽڪ، اينٽي ڪاڪسيوڊس هر وقت پاڻ وٽ موجود هجڻ گهرجن. جيڪڏهن هڪ ڏينهن جي علاج سان بهتري نه اچي ته علاج کي 3 کان 5 ڏينهن تائين جاري رکڻ گهرجي.

ڪيفيت 1 	رت وارا دست	قر بينو هوندو آهي ڪير پيئندو آهي پر بلڪل آهستي يا وري نه پيئندو آهي.	دستن بند ڪرڻ جي دوا ۽ دفعا اوآرايس ۽ سير پاڻي ۾ ۽ دفعا، سلفا سئي ۽ دفعا ۽ ڪاڪسڊيوسس واري دوا
	ڪڏهن ڪڏهن چيٽي سان رت ڳڙيل هوندو آهي	قر بيهي ڪونه سگهندو ۽ نه وري ڪير پيئندو آهي	دستن بند ڪرڻ جي دوا ۽ دفعا اوآرايس ۽ سير پاڻي ۾ ٿي دفعا، سلفا سئي ۽ دفعا ۽ ڪاڪسڊيوسس واري دوا

ڪيفيت 2 	شديد قسم جا دست بلڪل پاڻيائ ۽ صابڻ جي گج وانگر هوندا آهن	ڦر بينو هوندو آهي ڪير پيئندو آهي پر بلڪل آهستي يا وري نه پيئندو آهي. ڦر بيهي نه سگهندو آهي ۽ نه وري ڪير پيئندو آهي.	دستن بند ڪرڻ جي دوا ٻه دفعا اوآرايس ٻه سير پاڻي ۾ اينٽي بايوٽڪ 2 دفعا دستن بند ڪرڻ جي دوا ٻه دفعا اوآرايس ٻه سير پاڻي ۾ اينٽي بايوٽڪ 2 دفعا
ڪيفيت 3 	معمولي دست چيڙو نرم ايندو ڪجهه چدو هوندو	ڦر بينو هوندو آهي، ڪير آهستي پيئندو آهي يا وري پيئندو آهي. ڦر بيهي ڪونه سگهندو ڪير ڪو نه پي سگهندو.	آنديءَ معدي جي خرابي ۾ استعمال ٿيندڙ دوائون 2 دفعا دستن کي بند ڪرڻ واري دوا 2 دفعا

4.11 ڦرن ۾ نمونيا جي بيماري

ڦرن منجهه نمونيا جي بيماري ٻه هڪ اهم مسئلو هوندي آهي جيڪا مختلف جراثيمن جهڙوڪ بيڪٽيريا يا وري وائرس جي ڪري ٿيندي آهي.

نشانيون

- جانور موڪو ۽ سست هوندو آهي.
- جسماني بخار 105 فارنهائيٽ تائين هوندو آهي.
- ڦڦڑن جي متاثر هجڻ ڪري جانور ساهه ڪڍڻ دوران لڏندو آهي.
- نڪ منجهان پاڻيائ وهندي آهي.
- ٻنهي ناسن جي وچ واري ڪاري کل خشڪ هوندي آهي.
- شديد قسم جي کنگهه هوندي آهي.
- کاڏو پيتو بلڪل گهٽجيي ويندو آهي.

علاج

جراثيم ڪش ديرپا اثر واريون دوائون ۽ سوزش کي گهٽائڻ واريون دوائون ان سان گڏ مفت خور ڪيڑن کي مارڻ واريون دوائون ٻه ڏنيو ويندیون آهن.

باب پنجون. جانورن جو نسل وڌائڻ

5.1. جانور جي نسل وڌائڻ کي بهتر ڪرڻ

جانورن جي نسل وڌائڻ کي 2 طريقن سان بهتر ڪري سگهجي ٿو.
1) پهريان اسان کي سڻي نسل واري ٽيهاڙ حاصل ڪرڻي پوندي، ان جي سڻي واڌويجهه لاءِ ٽيهاڙ جي کاڌخوراڪ بهتر ڪرڻي پوندي ۽ شروعاتي عمر ۾ لڳ ڪرائجي ته جيئن ڦر جي وڃي، جڏهن ٽيهاڙ جو جسماني وزن 280 ڪلو ٿي وڃي (يا سيني جي ماپ) 150 سينٽي ميٽر ٿئي ته پوءِ لڳ ڪرڻ گهرجي.
2) ويامڙ ڪانپوءِ جلدي ٻيهر قرائڻ گهرجي، ٻن ڦرن جي وچ وارو عرص گهٽائجي.

5.1.1. شروعاتي سڻو نسل حاصل ڪرڻ (ٽيهاڙ لاءِ)

مينهن/ ڳئون ڏڪي ٽيڙ ڪانپوءِ ۽ ڦر ڏيڙ ڪانپوءِ ڪير ڏيندي آهي. سنڌ صوبي ۾ ڳئون 2.5- 3 سال جي عمر ۾ پهريون دفعو ڏڪي ٽيندي آهي ۽ پهريون ڦر 3.5- 4 سالن جي عمر ۾ ڏيندي. ٽيهاڙ کي شروعاتي عمر ۾ ڏڪو ڪرائڻ لاءِ ان جي واڌويجهه شروعاتي عمر ٽيڙ ضروري آهي.سنڌ صوبي جي بهراڙي ۾ ڦر جو روزانو وڏندڙ وزن تقريباً 0.25 ڪلوگرام آهي. اهو وزن تمام گهٽ آهي. جيڪو وڏو سبب آهي دير سان وهر ۾ اچڻ جو. روزاني جو وزن 0.5 ڪلوگرام وڌائڻ ممڪن ٽيندو، جيڪڏهن گهٽي ۽ سڻي معيار وارو سانڊيل گاهه (وڌيڪ تعداد ۾ تقريباً) 8 مهينن جي عمر تائين. ان سان ٽيهاڙ 1 کان ڏيڍ سال جي عمر ۾ لڳ ۾ ايندي.

(مينهن جا مثال)

* موجوده مينهن جي واڌويجهه سنڌ بهراڙيءَ ۾: 980 ڏينهن (3 سال) جسماني وزن ضروري آهي پهرين لڳ لاءِ

پئدائشي وزن 34ڪلوگرام + (980 ڏينهن * 0.25 ڪلوگرام) = 279 ڪلوگرام

* مينهن جي واڌويجهه بهتر ڪرڻ: 490 ڏينهن (1.5 سالن جي عمر) جسماني وزن ضروري آهي پهرين لڳ لاءِ.

پئدائشي وزن 34ڪلوگرام + (490 ڏينهن * 0.25 ڪلوگرام) = 279 ڪلوگرام

5.1.2 ويامڙ ڪانپوءِ جلدي ڏڪو ڪرڻ (ڦرجندڙ مينهن/ ڏڳي لاءِ)

(1) ويامڙ ڪانپوءِ جلدي اندروني ڇڪاس ڪرڻ

ويامڙ جي 30 کان 45 ڏينهن اندر ڳئون جي ٻچيداني پنهنجي اصلي حالت ۾اچي ٿي.
پنهنجي ڳئون جو ويامڙ ڪانپوءِ جلدي لڳ ڪرايو ته جيئن اها ٻيهر ڏڪي ٽئي. توهان کي جلدي ان تي عمل ڪرڻ گهرجي. ويامڙ جي 30 ڏينهن ڪانپوءِ ڳئون جي اندروني عضون جي ڇڪاس لاءِ ڊاڪٽر سان لهه وچڙ ۾ اچو. ان ٽائيم تي ڊاڪٽر جي ٻڌايل ضروري علاج ڳئون کي وهر ۾ آڻيندو ۽ شروعاتي وقت ۾ڳئون ٻيهر ڦرجي ويندي. ٻن ويامن جي وچ وارو عرصو گهٽائڻ جو مطلب آهي ته اسان جو جانور جي زندگي ۾ وڌيڪ ڦر حاصل ڪري سگهجن. ان جو مطلب اهو آهي ته ڳئون پنهنجي زندگيءَ ۾ وڌيڪ ڪير ڏئي ۽ پاڳئي جي آمدني ۾ اضافو ٽئي.

2) ويمڙ جي وچ وارو عرصو گهٽائڻ

الف. ڳئون

اهو ٿورو مشڪل آهي پر ارادو ڪري ڇڏيو ته سال ۾ هڪ ڦر حاصل ڪجي. جيڪڏهن

ڳئون جلدي ڏکي ٿيندي ته بن ويامن جي وچ وارو عرصو گهٽجي سگهي ٿو. ان جي نتيجي ۾ ڳئون جي ڪل عمر ۾ وڌيڪ ڪير جي پيداوار ملي سگهي ٿي.

هڪ سال ۾ 356 ڏينهن ٿين ٿا. ڳئون جو ڏکيڻ وارو عرصو 285 ڏينهن هوندو آهي. سال مان 285 ڏينهن هوندو آهي. سال مان 285 ڏينهن ڪٽبا ته 80 ڏينهن بچندا.

مثالطور تي جيڪڏهن 30 ڏينهن ۾ ٻچيداني پنهنجي اصلي حالت ۾ اچي ٿي ته 50 ڏينهن (80 ڏينهن- 30 ڏينهن) ٻئي ڦرجڻ لاءِ بچندا. جيڪڏهن ڳئون 50 ڏينهن جي عرصي دوران وهر ۾اچي ٿي ۽ ڦرجي وجي ٿي ته پوءِ سال ۾هڪ ڦر حاصل ڪري سگهجي ٿو. ڳئون ۾ وهر جو ڦيرو 21 ڏينهن هوندو آهي. ان عرصي دوران توهان وٽ 2 موقعا هوندا آهن ته اها وهر ۾ اچي ۽ فرجي وجي.

Example: Parturition interval : Case of Cattle

1 year (365 days)	
Pregnancy period 285days ±10 days	80 days

ب. ڳئون

مينهن جو ڏکيڻ جو عرصو ڳئون کان وڌيڪ هوندو آهي. ان ڪري اهو مشڪل آهي ته مينهن مان سال ۾ هڪ ڦر ونجي ڳئون جي بنسبت.
جيڪڏهن مينهن جلدي ڦرجي ويندي ته 2 ڦرن جي وچ وارو عرصو گهٽجي ويندو. ان نتيجي ۾ مينهن پنهنجي پوري زندگيءَ ۾ ڪير جي پيداوار وڌائي ڏيندي.

هڪ سال ۾ 365 ڏينهن ٿين ٿا. مينهن ۾ ڏکيڻ جو عرصو تقريباً 310 ڏينهن ٿئي ٿو. جيڪو ڳئون کان 25 ڏينهن وڌيڪ آهي. سال مان 310 ڏينهن ڪٽبا ته 55 ڏينهن بچندا. مثالطور تي جيڪڏهن ٻچيداني پنهنجي اصلي حالت ۾ 30 ڏينهن ۾ اچي ٿي. 55 ڏينهن مان 30 ڏينهن ڪٽبا ته 25 ڏينهن بچندا ٻئي ڦرجڻ جي لاءِ. جيڪڏهن مينهن 25 ڏينهن دوران وهر ۾ اچي ٿي ته سال ۾ هڪ ڦر حاصل ڪري سگهجي ٿو. پر اهو مينهن جي معاملي ۾ ڏکيو آهي. مينهن ۾ وهر جو ڦيرو 21 ڏينهن جو هوندو آهي. جيڪڏهن ان عرصي دوران توهان جي مينهن وهر ۾ اچي ٿي ته توهان پنهنجو مقصد حاصل ڪري سگهو ٿا. پر مينهن جي صورت ۾ اهو مشڪل آهي ڇو جو مينهن جو بن ڦرن جي وچ وارو عرصو وڌيڪ هوندو آهي. ڳئون کان.

Example: Parturition interval : Case of Buffalo

1 year (365 days)	
Pregnancy period 310days ±10 days	55 days

5.2. ڪنڊي مينهن ۾ وهر جانچڻ

ڪنڊي مينهن جو وهر جانچڻ لاءِ ان جو تفصيلي رڪارڊ موجود نه آهي. تنهن لاءِ نيلي راوي نسل جي رڪارڊ کي هيٺ تفصيل سان بيان ڪيو وي آهي. جيڪڏهن ڳئون سان پيٽيندا سين ته مينهن جو وهر جانچڻ ڏکيو ٿيندو.

	Time	%	
The night	18:00 - 22:00	19	85
	22:00 - 02:00	40	
	02:00 - 06:00	26	
The day	06:00 - 12:00	4	15
	12:00 - 18:00	11	

Table 5-2 Heat sign of Nili Ravi buffalo breed detected by time

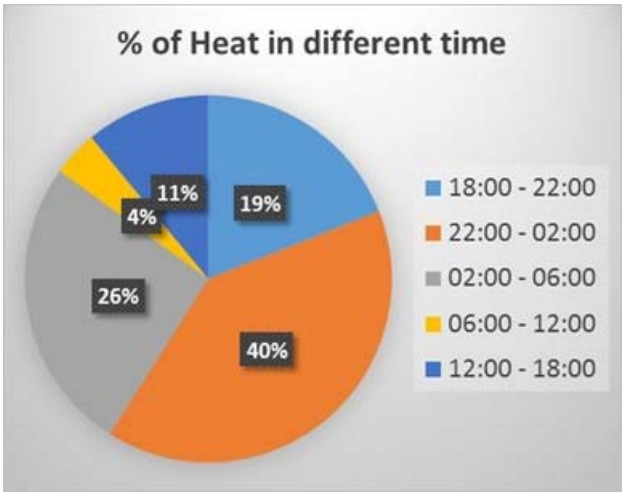


Figure 5-3 Heat sign of Nili Ravi buffalo breed detected by time

1) وهر

مينهون تقريباً رات جي وقت تي وهر ۾ ايندیون آهن. مثالطور تي 80فيصد وهر رات جي ٽائيم ظاهر ٿيو آهي. تنهن جي لاءِ ياڳين جي لاءِ ڏکيائي آهي ته مينهن ۾ وهر جون نشانيون جانچين. ڳئون جي برعڪس مينهن جو وهر جون نشانيون مختلف آهن، جيڪي هيٺ بيان ڪيون ويون آهن.

1) هڪ مينهن ٻي مينهن مٿان چڙهندي آهي مثالطور ڪائونٽرشپ ڏسپلي گهٽ ڏنو ويو آهي. (وهر مينهن پنهنجي ساٿي مينهن مٿان چڙهندي آهي).
2) ٻاهرين عضون مان ليس دار مادو خارج ٿيڻ وهر جي نشانين سان مشابهت نٿو رکي.
3) صرف 30 فيصد مينهون وهر جي حالت ۾ رنيندیون آهن.
4) وهر برقرار رکڻ جو وقت گهٽ هوندو آهي.
5) خاموش وهر (بغير نشانين جي وهر) بار بار ٿئي ٿو.

وهر ٻين نشانين سان به جانچي سگهجي ٿو. جيئن ڪير جي پيداوار گهٽجي وڃي، جانور بيچين رهندو آهي. جيڪڏهن ته اسان مينهن جي پوئين ٽنگن کي هٿ لڳائينداسين ته ڪائي حرڪت نه ڪندي.

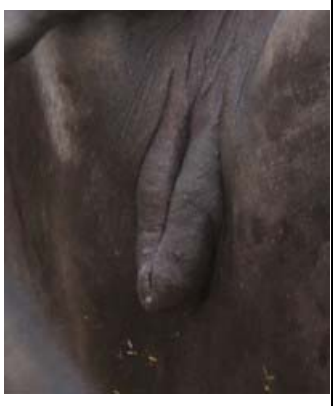


Photo 5-2 Swelling of external labium

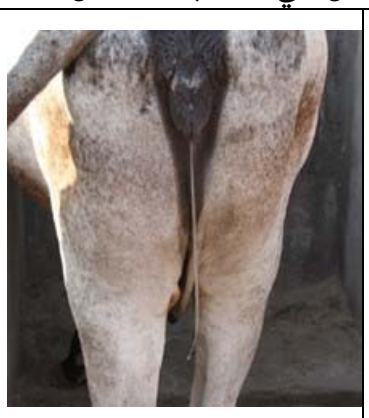


Photo 5-3 Mucus from external labium

Photo 5-4 Natural mating

5.3 مينهن ۾ وهر اچڻ جا وقت جانچڻ

مينهن جو ڏينهن ۾ 3 دفعا وهر جانچبو آهي. صبح، منجهند ۽ شام جو. تقريباً هڪ ڪلاڪ تي 10 منٽن تائين جانچڻ جي صلاح ڏجي ٿي. پنهنجي واڙي جي ڪليل ۽ چرائي واري جڳهه تي مينهن جو ٻي مينهن مٿان چڙهڻ جانچو ان سان وهر جانچڻ جي وڌيڪ خبر پوندي. جيئن ته مينهن لاءِ مٿي ٻڌايو ويو آهي ته اهي گهٽو ڪري رات جي وقت وهر ۾ اچن ٿيون مثالطور 19فيصد (18:00 کان 22:00) ڪلاڪن اندر ۽ 40فيصد (22:00 کان 02:00) ڪلاڪن اندر ٿيندیون آهن. ان ڪري اها صلاح ڏجي ٿي ته پاڻيو رات جو سمهڻ کان پهريان ضرور پنهنجي جانور جي جانچ ڪري سمهي.

5.4. جانور جو توليدي نظام جو رڪارڊ

توهان جانور جي ڊاڪٽر سان گڏجي پنهنجي جانور جي توليدي نظام کي بهتر ڪيو. پنهنجي مينهن/ ڳئون جي توليدي نظام کي بهتر ڪرڻ لاءِ ان جي توليدي سرگرمين جو رڪارڊ رکڻ پهريون قدم آهي. هيٺ ڏنل ڪئلنڈر کي ڏسو ۽ رڪارڊ رکڻ سکو ۽ ان تي عمل ڪيو.

سنڌ صوبي ۾ موجود پاڻيا پنهجي جانور جي لاءِ ڪو به اُپاءُ نٿا ونن پلي ڊگهي عرصي تائين جانور ڏکو نه ٿيندو هجي. جانور جي توليدي نظام کي صحيح طريقي سان جانچڻ ۽ ان جي علاج جو رجحان سنڌ جي ٻهراڙي ۾ اجا تائين ايترو عام نه آهي. ڪجهه جانورن جا ماهر ڊاڪٽر مخصوص آهن. جانورن جي توليدي نظام ۽ صحت جي لاءِ. توليدي نظام جي سرگرمين جو رڪارڊ رکڻ ضروري آهي.

اهو رڪارڊ توهان کي جانور ۾ صحيح طريقي سان بيماري سجاڻڻ ۽ جانورن جي ڊاڪٽر کان علاج ڪرائڻ ۾ مدد ڏيندو.

اچو ته توليدي سرگرمين جو رڪارڊ رکڻ شروع ڪيون.

سڀ کان پهريون قدم توهان جي مينهن/ ڍڳي جو نالو رڪارڊ رکڻ لاءِ ڪنهن به قسم جو ڪئلنڈر استعمال ڪنداسين. هيٺين معلومات نوٽ ڪنداسين. هر ڏينهن جي سرگرمين جي جيڪو روزانو ٿين.

1) ويامڻ جو رڪارڊ رکڻ: ماءُ جو نالو

2) وهر ۾ اچڻ جو رڪارڊ: مينهن/ ڍڳي جو نالو جيڪا وهر ۾ آئي هجي.

3) لڳ جو رڪارڊ : لڳ ۾ آيل مينهن/ ڍڳي جو نالو، لڳ جو قسم مثالطور: يا قدرتي لڳ (يا هٿرادو) طريقي سان ٻج رکرائڻ (اي آئي)، سانهه جو نالو.

4) ٻي ڪا معلومات: جيئن حمل ضايع ٿيڻ (ڪچا ڦر ڇڏڻ)، جانور ڪپائڻ، جانور جو مري وڃڻ ۽ ٻي اهڙي جانور متعلق ڄاڻ.

Table 5-3 Sample of reproduction record (calendar type)

Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.
Note: NM: Natural mating A I : Artificial Insemination				1	2	3
4	5 Basir, Heat	6 Basir, NM	7	8	9	10 No.211, Died
11	12	13	14	15 Badin, Heat	16	17
18	19 Tand, Abortion	20	21	22 Memon, Delivery	23	24
25	26 Hyde, AI	27	28	29 Tand, Sold	30	31

باب ڇهون. جانور جي صحت

6.1. جراثيمن کان پاڪ ڪرڻ بهتر اُپاءُ

سنڌ صوبي ۾ ڏيان سان جراثيمن کان پاڪ ڪرڻ جا اُپاءُ نہ ورتا ويندا آهن. ٽُڪن لڳائڻ جون سُيون، علاج ڪرڻ جو سُيون ۽ ٻچيداني ۾ دوا رکڻ جا اوزار جراثيم کان پاڪ ڪري استعمال نٿا ڪيا وڃن. ويم دوران ماهر ڊاڪٽر رحم جي اندر هٿ وجهڻ کان پهريان پنهنجا هٿ جراثيمن کان پاڪ نٿا ڪن. جراثيمن کان پاڪ نہ ڪرڻ جون خاص سبب/ رڪاوٽون هي آهن.

1) الڪوحل خريد ڪرڻ کان پهرين اجازت ونڊي پوندي. الڪوحل جراثيمن کان پاڪ ڪرڻ لاءِ استعمال ٿئي ٿو. (حادثاتي طور تي الڪوحل پيئڻ کان پاسو ڪريو).

2) سُئي هٽڻ جي ٽائيم تي جانور کي سنيالڻ مشڪل هوندو آهي (جانور اچانڪ سُئي لڳڻ جي ڪري نروس ٿي ويندو آهي. جراثيمن کان پاڪ ڪرڻ جو ڪوبہ مناسب اُپاءُ نہ آهي). 3) سُئي جي گهٽتائي هجڻ ڪري. مٿي ڏنل رڪاوٽن وارا سڀ اُپاءُ ذهن ۾ رکو ۽ هيٺ ڏنل جراثيمن کان پاڪ ڪرڻ وارا اُپاءُ ونو. پنهنجي جانور کي وڇڙندڙ بيمارين کان بچائڻ لاءِ جيڪي بيماريون هڪ جانور مان ٻئي جانور ۾ منتقل ٿين ٿيون صفائي سترائي جو خيال نہ رکڻ جي ڪري.

سرنج ۽ ان جي سُئي ۽ ٻيا اوزار جيڪي جانور جي علاج لاءِ استعمال ٿين ٿا. ان کي اَبارڻ جي ذريعي جراثيمن کان پاڪ ڪيو. اهي جراثيمن کان پاڪ ٿيل سرنج، ان جي سُئي ۽ ٻيا اوزار جراثيمن کان پاڪ ڪري ڪنهن جراثيمن کان پاڪ ڊبي يا شيشي جي ڪنهن باڪس ۾ رکو. استعمال ٿيل سرنج، ان جي سُئي يا ٻيا اوزار جراثيم کان پاڪ ٿيل اوزارن سان نہ ملائي رکو. الڪوحل جي بنسبت ڊيٽول آساني سان مارڪيٽ ۾ ملي ٿو، جيڪو جراثيمن کان پاڪ ڪرڻ لاءِ استعمال ڪري سگهجي ٿو. ماهر خوفزده يا چتي جانور کي جلدي سان قوهاري ذريعي جراثيمن کان پاڪ ڪندا آهن ان جي جلدي پري پيچي وڃڻ کان پهريان.

Photo 6-2 Schimmelbusch (boiling-sterilizer) and metal box for disinfected syringes and needles

Photo 6-1 Spray for disinfection

6.2. بچاءُ کي اهميت ڏيڻ

جانورن جي وڇڙندڙ بيمارين جي بچاءُ تي ڏيان ڏيو.

هڪ دفعو جڏهن جوان جانور بيمار ٿيندو آهي تہ ان جي واڌويجهه ٻيهي رهندي. جيڪڏهن هڪ ڪير ڏيندڙ ڳئون/ مينهن بيمار ٿئي تي تہ ان جي ڪير جي پيداوار گهٽجي ويندي. جيڪڏهن ڪير جي پيداوار پهرين سالانہ ڪير جهڙي نہ ٿي تہ فارم تي تمام گهڻي پئسي جي نقصان جو سبب بڻجندي. بچاءُ تي گهٽ خرچ هوندو آهي. علاج ڪرائڻ کان. تنهن جي لاءِ جانور کي بيمارين کان بچائڻ جي

لاءِ تمام ضروري هوندو آهي. ان جي صحت کي برقرار رکڻ لاءِ.

وڇڙندڙ بيمارين کان بچاءُ لاءِ حفاظتي بچاءُ جو ٽُڪو لڳرائڻ گهرجي ۽ وقت تي اندرين ۽ ٻاهرين کيڙن کان بچاءُ جي دوا پيارجي. جڏهن ڪُئون ڪمزور ٿي ويندي آهي تہ بيمارين کان پاڻ کي محفوظ ڪرڻ جي صلاحيت گهٽجي ويندي اٿس ان جي ڪري آساني سان بيمار ٿي پوندي آهي. جيڪڏهن روزانو کاڌخوراڪ جي سارسنڀال صحيح ڪجي تہ جانور جي جسماني صحت برقرار رهندي ۽ اهو جانور کي بيمارين کان بچائن لاءِ تمام گهڻو ضروري آهي.

6.2.2. مُنهن ڪُرُ

مُنهن ڪُرُ بيماري ڇا آهي؟

مُنهن ڪُرُ بيماري بن ڪُرن وارن جانور ۾ ٿئي ٿي (ڪُر بن حصن ۾ ورهايل هجي). جنهن ۾ ڪُئون، مينهن، اٽ، ٻڪري ۽ ريڍ شامل آهن. هن بيماري جي نشاني هي آهي تہ جانور جي وات ۽ اندرين مهارن ۽ ڪُرن جي وچ ۾ پاڻي سان پريل ڦلوڪٽا ٿيندا آهن ۽ اها بيماري وات جي چالن واري بيماري سان مشابهت رکي ٿي. ان جي ڪري وات جي چالن جي بيماري ۽ سامهاڙي جي بيماري سڃاڻي نٿي سگهجي. جيڪڏهن توهان کي پنهنجي جانور ۾ اهڙي قسم جون نشانيون ڏسڻ ۾ اچن تہ جانورن جي پالنا واري ڪاتي سان جلد کان جلد رابطو ڪريو ۽ رت جو نمونو ڪڍي ٽيسٽ ڪرائڻ لاءِ ليبارٽري موڪليو.

شروعات ۾ ڦلوڪٽا وات، نڪ، ڪُرن ۽ ٽٽن تي ٽين ٿا. پهريان اهي ڳاڙها ۽ سُور وارا هوندا آهن ۽ پوءِ اهي السر جي شڪل اختيار ڪندا آهن. وات ۾ تڪليف (السر) جي ڪري جانور جي بک ختم ٿي ويندي آهي. ڪُرن ۾ چالا (السر) ٽيڻ جي ڪري جانور تڪليف محسوس ڪندو آهي ۽ تڪليف جي ڪري جانور منڊڪائيندو آهي. هن بيماري جون خاص نشانيون تہ مُنهن ڪُرُن تي آهن ان ڪري هن بيماري کي مُنهن ڪُرُ جو نالو ڏنو آهي. مُنهن ڪُرُ بيماري موتمار نہ آهي پر هڪ دفعو جڏهن جانور جسماني وزن ۽ ڪير جي پيداوار گهٽائي ٿو تہ ان کي ٻيهر اصلي حالت ۾ اچڻ ۾ ٽائيم لڳندو. هڪ مينهن جو مُنهن ڪُرُ بيماري ۾ مبتلا ٽيڻ جو نقصان گهٽ آهي، پر ان علائقي ۽ ملڪ کي پئسي جو گهڻو نقصان ٽيندو آهي.

* جراثيمن کان پاڪ ڪرڻ: مُنهن ڪُرُ بيماري کي آساني ۽ گهٽ خرچ ۾ جراثيمن کان پاڪ ڪرڻ لاءِ ڪاسٽڪ سوڊا، سوڊيم ڪاربونيٽ، ايسٽڪ ايسڊ. ان کي ايسڊ استعمال ڪري سگهجن ٿا. ان سان ايسڊ جي مقابلي ۾ بيماري کان بچڻ جي قوت ٽئي ٽي.

* بيماري جو ڦهلجڻ: بيمار جانور جي ساهه کڻڻ دوران نڪرندر پاڻيات مُنهن ڪُرُ وائرس ٻين جانورن ۾ منتقل ٿئي ٿو. هوا جي ذريعي 50 ڪلوميٽر جي فاصلي تائين پڻ اهو وائرس ڦهلجي ٿو.

6.2.2. گل گهوٽي جي بيماري

اها هڪ بيڪٽيريا مان ٽيندڙ بيماري آهي. ان بيماري جون خاص نشانيون اهي آهن تہ بيماري ۾ مبتلا جانور جون نشانيون ظاهر ٽيڻ کانپوءِ 8 کان 24 ڪلاڪن اندر جانور مري ويندو آهي. گل گهوٽي جي بيماري جو ٽُڪو ڪمري جي گرمي پد تي رکيو ويندو آهي ۽ اهو پڻ سستو هوندو آهي. گهوگهي جي بيماري کان بچڻ لاءِ ان جو ٽُڪو سال ۾ هڪ دفعو مخصوي ٽائيم تي لڳرائجي.

گهوگهي واري بيماري مينهن ۽ ڪُئون ۾ گهڻو ڪري ٿئي ٿي. ايئن بہ چئي سگهجي ٿو تہ مينهون، ڍڳين کان وڌيڪ ان بيماري ۾ مبتلا ٽين ٽيون. اها موتمار بيماري آهي جيڪا جانور کي گهٽ ٽائيم اندر موت ڏي وڃي ٿي، ان جي ڪري شروعاتي نشانيون ڏسڻ مشڪل هوندو آهي. شروعاتي

نشانيون جيئن بخار، نڪ ۽ وات مان ڳڳ وهڻ. گهوگهي جي بيماريءَ جو وائرس وات مان وهندڙ ڳِڳ ۽ نڪ مان وهندڙ پاڻي جي ذريعي ٻين جانورن کي لڳي ٿو.

6.2.3 پيٽ جا کيڙا

سالياني پيٽ جي کيڙن جي ڪنٽرول مطابق دوا پياريو (جيڪو هن ڪتاب ۾ ڏنل آهي). پيٽ جي کيڙن جي دوا وات جي رستي پيارڻ ۾ سستي ۽ وڌيڪ اثرائتي هوندي آهي.

1) ڦرن کي پيٽ جي کيڙن جي دوا پيارڻ

نئين ڄاول ڦرن جي جسم ۾ گهٽ تعداد ۾ جيوڙا هوندا آهن پر جڏهن ڦر وڌا ٿيندا آهن ته جيوڙا انهن جي جسم ۾ آهستي آهستي وڌندا ويندا آهن. جيڪي ڦر سني کاڌخوراڪ تي وڌندا آهن. انهن اندر بيمارين کان بچڻ جي صلاحيت وڌيڪ هوندي آهي. جڏهن اهي پنهنجي عمر جا 6 مهينا پورا ڪندا آهن. ڦرن جي جسم ۾ جيوڙن جو تعداد 6 مهينن کانپوءِ آهستي آهستي گهٽجي ويندو آهي. ٻئي پاسي ڪمزور ڦر ۽ گهٽ خوراڪ تي پلجندڙ ڦرن جي جسم ۾ جيوڙن جي تعداد جلدي سان وڌندي آهي. جنهن جي ڪري دست ۽ نمونيا ٿيندي آهي. تنهن جي ڪري ڦر پنهنجي جسم کي مضبوط رکڻ جي صلاحيت ختم ڪري وهندا آهن. اها هڪ خطرناڪ ڳالهه آهي. سڀ کان اهم ڳالهه اها آهي ته ڦرن کي سني کاڌخوراڪ ڏيو ساڳئي وقت اهو به ضروري آهي ته ڦرن کي شروعاتي مهينن ۾ پيٽ جي کيڙن جي دوا پياريو. جيوڙن کان بچايو جيڪي ڦهلجن تا آلي فرش مان، جتي ڦر پاليو تا ان جڳهه کي هميشه خشڪ رکو.

Photo 6-3 Deworming in the iron race

Photo 6-4 Deworming in a paddock

Photo6-5 Deworming in a field

6.2.4 رت ۾ پروٽوزوا جي بيماري

رت جا پروٽوزوا جيئن اينا‌پلازما، بيبيسيا، ٽليريا ۽ ٻيا. اهي ٽئي تيزبخار سان ٽين ٽا. جڏهن توهان جي ڳئون کي تيزبخار هجي ته جلد جانورن جي ڊاڪٽر سان رابطو ڪيو. جانورن جو ڊاڪٽر چيڪ ڪندو ۽ ٻڌائيندو ته ڪهڙي قسم جي بيماري آهي جلدي صحيح علاج ڪندو. رت ۾ پروٽوزوا جي بيماري منتقل ٿيندي آهي. ٻاهرين کيڙن جي رستي جهڙوڪ چچڙ، هارس فلائي، اسٽيبل فلائي. ان لاءِ کيڙا مار دوائن جو ڦوهارو ڪيو يا اهڙو ڪجهه ڪيو ته جيئن اهي پري پيچي وڃن.

6.2.5 Prevention and treatment of mastitis

Please refer to the comic ‘Let’s learn about mastitis’.

HEALTH CALENDAR TO PREVENT THE CALVES AGAINST CONTAGIOUS AND PARASITIC DISEASES

Vaccination

Category and Species	Jan.	Feb.	March	Apr.	May	Jun	Jul	Aug	Sep	Oct	Nov.	Dec.
						Rainy Seasons						
Adult & Young of Cattle and Buffalo				**B.Q. Vaccine** once in a year		**H.S.Vaccine** twice in a year				**F.M.D.Vaccine** twice in a year		**H.S.Vaccine** twice in a yea

Birth →	1st Month				2nd Month				3rd Month				4th Month				5th Month				6th Month				8 Month				9 Month				10 Month			
Week	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Calves of Cattle and Buffalo							**H.S.Vaccine** 1st dose 6th weeks , than twice in a year as per calendar																				**H.S.Vaccine** After 6th months from 1st dose											
									F.M.D.Vaccine 1st dose 1st week of 3rd months																													
													Booster dose after 1 month from 1st dose 2nd dose after 6th month from1st dose																							
																					B.Q. Vaccine 1st dose 6th months and above, than follow annually calendar															

Deworming

Category and Species	Jan.	Feb.	March	Apr.	May	Jun	Jul	Aug	Sep	Oct	Nov.	Dec.
Adult & Young of Cattle and Buffalo		1) Drench	1)Ivermectine (2 weeks after drench)			2 times drenching might be enough. Will be examined again by seeing the result. 2) Drench	2)Ivermectine (2 weeks after drench)			3) Drench	3)Ivermectine (2 weeks after dren	

Month	1st Month				2nd Month				3rd Month				4th Month				5th Month				6th Month				8 Month				9 Month				10 Month			
Week	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Calves of Cattle and Buffalo	1st Dose of **Drench** shuould be given at the age of 30 days, than follow the calendar						**Ivermectin** should be applied after 10 days of drench than follow the calendar																															

HS:Hemorrhagic Septicemia FMD : Food and Mouth Disease BQ: Black Quarter

Figure6-1 Animal Health Calendar

Reference

Japan International Cooperation Agency (January 2016), 2.1.2. Activity Output 1 Page14-42, 2.2 Outcome of activities in *Project Progress Report (Second Year) of the Project on Sustainable Livestock Development for Rural Sindh "PSLD"*, Tokyo, JICA, pp 49-63

Japan International Cooperation Agency (February 2017), Chapter 3 Preparation of Third Country Training (Thailand) in *Project Progress Report (Third Year) of the Project on Sustainable Livestock Development for Rural Sindh "PSLD"*, Tokyo, JICA, pp19

Japan International Cooperation Agency (February 2017), Chapter 3 Output 1&2 in *Project Progress Report (Third Year) of the Project on Sustainable Livestock Development for Rural Sindh "PSLD"*, Tokyo, JICA, pp 21-71

Japan International Cooperation Agency (February 2018), Chapter 3 in P*roject Progress Report (Forth Year) of the Project on Sustainable Livestock Development for Rural Sindh "PSLD"*, Tokyo, JICA, pp 11-70

Japan International Cooperation Agency (February 2018), Attachment, in P*roject Progress Report (Forth Year) of the Project on Sustainable Livestock Development for Rural Sindh "PSLD"*, Tokyo, JICA, pp A50-A91

Japan Livestock Technology Association (March 2003), Cow Foot Care Manual, Tokyo, Japan Livestock Technology Association

Tominaga, H (2001), Manual de intorduccion al pastreo, Projecto de Mejoramiento de ganado Bovino de Carne, Rsanta Cruz, Bolivia, JICA-UAGRM, pp 9-10

Tomigana, H (2012), Cartoon Mastitis, Pojecto de Mejoramiento de la Productividad Ganaderr para los Productores de Pequeno y Mediana Escal en Nicaragua "PROGANIC II", Managua, Nicaragua, JICA-MAGFOR-UNA-IDR

別添資料 T3-7 普及チーム用指導要領

The Project on Sustainable Livestock Development
for Rural SINDH "PSLD"
(JICA Technical Cooperation)

Teaching Guide for Extension Team

March 2019

AP2-404

March 2019

Produced by The Project on Sustainable Livestock Development for Rural Sindh (PSLD)

Sponsored by Japan International Cooperation Agency (JICA)

Table of Contents

1. Introduction

The Project on Sustainable Livestock Development for Rural Sindh (hereafter the Project) disseminates appropriate technology to the farmers. As a means of dissemination, the Project aims at two types of technology transfer; 1) technical training by extension workers to farmers for eight subjects, and 2) farmer to farmer extension. For the latter, the Project assume spontaneous occurrence or voluntary activity by the first beneficiaries. The Project will disseminate appropriate technology to 3,000 farmers (2,000 male, 1,000 female) who lives in the Project area of five districts, Badin, Hyderabad, Matiari, Tando Allahyah and Tando Muhammad Khan by the end of the Project. Extension activities will be conducted in accordance with the flow which shown in Figure 1.

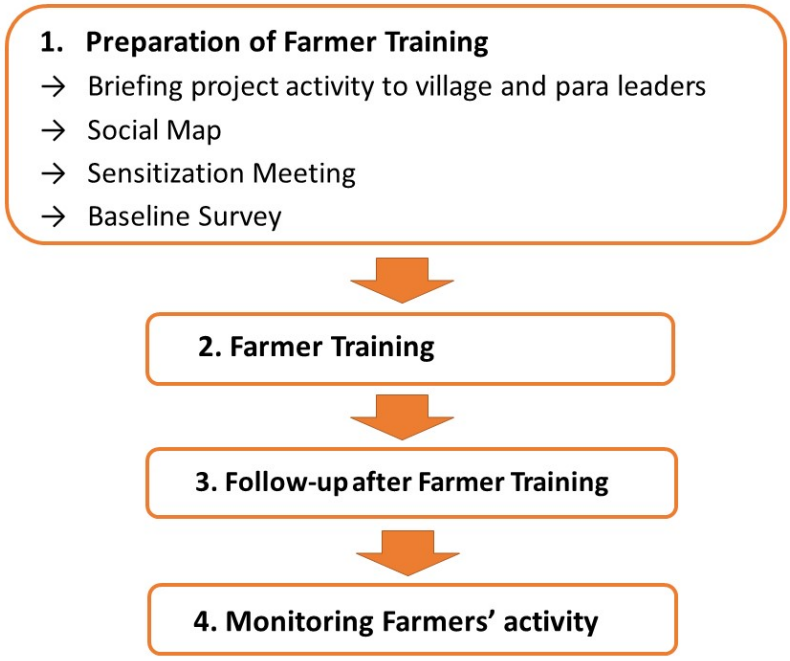


Figure 1 Flow of Extension Activity

2. Extension Guideline and Standard Operation Procedures (SOP)

Principle of extension activity and SOP are explained in *Extension Guideline*[1]. The Project developed eight of SOP as shown in Table 1.

Table 1 List of developed SOPs

No.	Name of SOP	No.	Name of SOP
1	SOP for Development of Training Materials for Farmer Training	5	SOP for Farmer Training
2	SOP for Social Map	6	SOP for Follow-up after Farmer Training
3	SOP for Sensitization Meeting	7	SOP for Monitoring Farmers' activity
4	SOP for Baseline Survey	8	SOP for Car management

[1] *Extension Guideline* is a separate booklet.

3. Preparation of Farmer Training

There are four stages for preparation of the Farmer Training as follows:

3.1 Briefing project activity to village and para leaders

Most villages have their own village leaders. For smooth implementation of extension activities, the cooperation of the village leader/para leaders is necessary. Therefore, the Project will explain about project activities to the village leaders and confirm the outline of the village situation. Then, the Project will ask them to cooperate with project activities.

3.2 Social Map

The Project will conduct a workshop in each village to make a social map, collect the name of household heads, and interview about training preparation. The social map is to identify the number of biradaris and paras, including their location in the village. The household list is to identify target households for the training by livestock and landholding status. This information is useful for proper grouping for training. Items for data collection by social map making are shown in Table 2. This data can be collected in half a day, even if the target village is very large.

Table 2 Data collection by social map making

Drawing Item on the Social Map	Interview Items
1. Border of the village including roads and canals	1.Name of village leader
2. Name of surrounding villages and location	2. Name of biradari (or para) leader
3. Facilities in the village	3. Name of social workers with livestock holding status and main role for activities
4. Number of biradaris and location of paras	4. Relationship among biradaris
5. Name of the household heads of each biradari or each para	5. Relationship among surrounding villages

(Note) It is difficult to find out the name of female social workers from a survey of the whole village because attendance is normally only male. It is necessary to briefly interview women in a separate session.

On the social map-making day, only the name of household heads should be collected. After that, detailed data, such as population of each household, number of livestock and area of owned land, should be collected on another day. Items of data collection for making the household list are proposed in Table 3.

Table 3 Data collection for making household list

Details of data to be collected for making household lists
1. Population of household (household means they have a separate kitchen from other households and a different income source)
2. Number of livestock (only large milk animals such as buffaloes and

cows; number of animals owned individually and shared should be separated.
3.Area of owned land
4. Occupation (main income source)

(Note) The name of household head and name of biradaris or paras will be identified during making of the social map.

The following items in Table 4 should be collected through interviews during making the social map.

Table 4 Interview about training arrangements

Interview items
1. Role and responsibility for livestock activities (Prepare activities list before the interview. Both men and women should be asked.)
2. Possibility of conducting mixed-biradari training
3. Possibility of conducting mixed-gender training
4. Possibility of accepting a male trainer for female training
5. Suitable training timing for farmers
6. Possibility of visiting pilot farmer by other farmers

3.3 Sensitization Meeting

The Project will conduct a sensitization meeting in each village to explain the project activities and appropriate technologies. The program will consist of an introduction to the Project, contents of the project activities, and confirmation of those interested in participating in the training. During the sensitization meeting, the Project will clearly explain to the villagers what the Project can do and cannot do, to avoid the villagers having excessive expectations of the Project. The Project will provide only technical support and advice for livestock activities through training and monitoring. Apart from training materials, materials for Project introduction will be prepared. As for a resource person of the Project introduction, pilot farmers and village heads will be considered. At the end of meeting, name of farmers who willingly to attend Farmer Training will be collected as a training participants register. Then, training group will be formed and training type will be confirmed. There are three types of training: 1) Mixed- gender and separate baradari, 2) separate gender and mixed-biradari, 3) separate gender and separate biradari. Meeting program, List of materials and training register format are shown in Attachment 3, Attachment 4 and Attachment 5.

3.4 Baseline survey

Before start Farmer Training, baseline survey will be conducted to check current situation for usage of appropriate technology by the Appropriate Technology Development Checklist Questionnaire. Target of this survey is the farmer who registered for Farmer Training. Baseline formats are shown in Attachment 6 and Attachment 7.

4. Farmer Training

There are eight subjects for Farmer Training; Feeding management, Livestock Management, Animal health, Mastitis, Body Measurement and BCS, Reproduction and genetics, Calf rearing, and Marketing. One cycle of Farmer training will complete once a week training in continuous eight weeks (about 2 months). Training duration is from 60 minutes to 90 minutes per a time. Each training program are shown in Attachment 8 to Attachment 15. Refer detail training contents to *Materials for Teaching the Farmers*[2].

5. Follow-up after Farmer Training

Because of Farmer Training, the Extension Team will work at the same village once a week in continuous eight weeks. Therefore, the Extension Team will make simple questions about previous training contents to the training participants to check their level of understanding. Then the Team will also check situation of livestock management by the training participants and necessary advice will be given. Question guide for follow-up is shown in Attachment 17.

6. Monitoring Farmers' Activity

Monitoring will be conducted to measure degree of adoption of appropriate technology by the farmers using the Appropriate Technology Development Checklist Questionnaire after six months from the end of a series of training. Not only the interviews, but also actual condition of livestock farm will be checked by direct observation of E/Ws in accordance with the items in observation sheet. Monitoring will be conducted every six months. Monitoring formats are same as baseline survey as shown in Attachment 6 and Attachment 7.

7. Selection of Core farmer

From 25 pilot villages, 19 core farmers were selected based on criteria. Criteria are following points 1) times of attendance to training sessions, 2) situation of appropriate technology adoption and 3) personality. The Project developed '*Basic information for the core farmers*' as a text book for the core farmers. Three days training program (Attachment 19) for the core farmers as refresher course was also developed. Core farmer training and activity by the core farmers will be implemented in extension period of the fifth year. The core farmers will be selected in surrounding villages after completion of Farmer training.

8. Required skill and attitude for the Extension worker

Principles for field visit and Report writing for Extension worker are explained in *Handbook for Extension Team*[3]. Monitoring and Evaluation Sheet of Extension Workers and Self Evaluation Sheet for Extension Team are shown in Attachment 20 and Attachment 21.

---

[2] *Materials for Teaching the Farmers* is a separate booklet.

[3] *Handbook for Extension Team* is a separate booklet.

Attachment 1 Procedure of Social Map

Social Map meeting at village

- Recitation from Holy Quran
- Introduction of team and Participants
- Introduction of Project
- Why we conduct Social Mapping (To understand the social structure of village and disseminate the appropriate technologies to whole village and surrounding villages)

Procedure of social map

1. Ask participants direction (north, south, east, west).

2. Ask participants main road to the village.

3. Ask participants border of the village.
   →Confirm the village border first before you start detail work.

4. Ask participants border of the para.
   →Confirm the para border first before you start detail work

5. Ask participants following details.
   1) Public place (school, autaq, mosque etc.)
   2) Shops
   3) Location of household
      → In case of large village, it is no need to reflect on the map to save the time. However, name of household head should be collected.

   4) Name of biradari.

   5) Leader of village and para level.

   6) Name of surrounding villages.

   7) Review of Social Mapping at the village/ District office.

Attachment 2 Household list

گوٹ جو نالو (Name of Village)_____

تعلقو (Taluka)_____

ضلعو (District)_____

Income source	Land (Acre)		Number of animal		Population	Para	Biradari	Name of Farmer	Sr. NO
	Tenent	Own	Sharing	Personal					
									1
									2
									3
									4
									5
									6
									7
									8
									9
									10
									11
									12
									13
									14
									15
									16
									17
									18
									19
									20
									21
									22
									23
									24
									25
									26
									27
									28
									29
									30
									31
									32
									33
									34
									35
									36
									37
									38
									39
									40

Extension Worker (توسیع کارکن) Date: (تاریخ)

Attachment 3 Contents and Program of Sensitization Meeting

Total required time is 70 minutes

Time required	Program	Contents
5 minutes	1. Introduction of the member	Introduction of the Project staff and Pilot farmer
5 minutes	2. Overview of the Project and importance of appropriate technology	2-1 Concept of the Project *(Explain verbally, no materials for this section.)* The Project aims to disseminate appropriate technology to the farmers broadly to increase their milk production with good quality and generating their income. The Project promotes that farmers would be market conscious and produce good quality of milk. Adulteration might give them benefit in short period, however, it will be a cause to lose trust from the market and consumers. Recognition from the market and consumers is crucial that farmer is high quality milk producer.
15 minutes		2-2 Introduction of the Project activities *(Use the materials from No.1 to No.32)* The Project is developing appropriate dairy farming technology in 8 field; farm management, marketing, feeding management, fodder, reproduction, animal health, genetic improvement and animal asset.
5 minutes		2-3 To increase milk production, what should we do? Feeding management will be required before everything else. If buffaloes are not given feed properly, they cannot produce good volume of milk. On top of that although buffaloes have conception problems, veterinarians cannot treat them if their body condition is bad.
5 minutes		2-4 To produce good quality of milk, what should we do? *(Use the materials from No.33 to No. 37)* It is required that 1) No adulteration and 2) Hygienic milk production
10 minutes	3. Pilot farmer's story	Request to the Pilot farmers to speak to the participants about his/her experience.

Time required	Program	Contents
		Topic is improvement on the dairy production after she/he joined the Project activities in terms of milk production and income generation.
10 minutes	4. Technical Training	4-1 Introduction of the Project technical training *(Use the materials from No.38-No.40)* Grouping The Project provides training to a group in the village. There are three types of group; 1) mixed-gender and same biradari group, 2) separate gender and mixed biradari group, and 3) separate gender and separate biradari group. Type of group will be discussed with the farmers. Number and size of group will also be discussed. Training contents At present, the Project can provide feeding management, animal health (mastitis) and calf rearing training. Other subjects will be added later. Condition The Project will provide to the farmers only technical training and advice.
15 minutes		4-2 Seeking participants for the technical training The Extension Team ask the participants their willingness to attend the technical training <Training participants Criteria> ●Small scale farmer who has less than 5 animals. Sharing is also accepted. ●Those who are doing livestock rearing by themselves. ●Training for female will be discussed later.

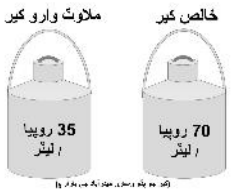
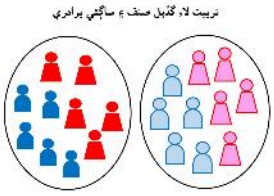
End

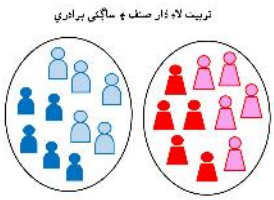
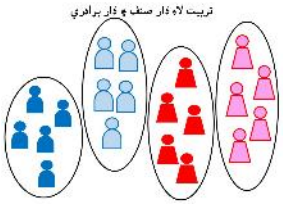
Attachment 4 List of Sensitization Materials

No.	theme	Picture	Talking note
1	Title		
2	Farm management		In our country animals are reared in traditional way. Observe hygienic condition at the parking place of animals and avoid direct sunshine and wetness.
3	Farm management		When parking animals under the trees remember to provide enough feed and plenty of water around the clock.
4	Farm management		Always feed the animals in feeding mangers who avoid loss of feed. Provide drinking water 24 hours.
5	Farm management		While milking the animals use proper type of sheds with good ventilation. Clean milking area before milking and wash your hands and milking utensil.

No.	theme	Picture	Talking note
6	Fodder		Animal production depends on good feeding. Feed the green fodder to animals after chopping for proper digestion
7	Fodder		To overcome the shortage of green fodder the project has conducted experiments successfully on Hay making
8	Animal Health		For the maintenance of animal health, Remember prevention better than cure vaccinate the animals every year timely against contagious diseases.
9	Animal Health		Drench the animals against endo parasites twice a year.
10	Animal Health		Under the Project Treat the animals against Mastitis very early stage through simple test.
11	Calf Rearing		In our country it is difficult to rear the small calves because they die due to disease.

No.	theme	Picture	Talking note
12	Calf Rearing		This project advises to rearing the calves. Keep the calves separately at clean place and avoid wetness. Use your technical skill to rear the calves. Feed the young calves separately and make sure availability of water and feed throughout the day.
13	Marketing		The best is to sale the milk as pure to get good rates. Milk adulterated water will not fetch good price. It's good to sale the milk at the doors in nearby town instead of supplying to a milk trader/ collectors middle man collect the pure milk form the village and sell it in whole sale market at nearby town.
14	Reproduction		Under this project farmers get at least one calf in a year. Female animals cannot calving every year consent to the veterinary doctor.
15	Animal Genetics		The province of Sindh possess very good animal breed especially Kundhi buffalo and red sindhi Cows.
16	Animal Genetics		Under the project the information regarding of animal breed is being collected by experts who save the breeds.

No.	theme	Picture	Talking note
17	Production of good quality milk		This is pure milk.
18	Production of good quality milk		This is under adulteration.
19	Production of good quality milk		AS IF you got large quantity of milk. BUT…
20	Production of good quality milk		This is wholesale market price of milk in Hyderabad. The price of rural farmers' milk is shown the half price of commercial farmers' milk. The market doesn't trust rural farmer's milk on purity.
21	Production of good quality milk		Production of pure milk is necessary to get more income.
22	Grouping for training		Mixed gender and same biradari training

No.	theme	Picture	Talking note
23	Grouping for training		Separate gender and mixed biradari training
24	Grouping for training		Separate gender and separate biradari training

End

Attachment 5 Training Registration Form

تربیت ۾ شموليت لاءِ فارم (Registration Farm for Training)

ڳوٺ جو نالو (Name of Village)_____ **تربیت لاءِ ڏينهن** (Day for training)_____

تعلقو (Taluka)_____ **تربیت لاءِ جاءِ** (Venue for training) _____

ضلعو (District)_____ **تربیت جو وقت** (Time for training)_____

Land (Acre)		Number of animal		Para	Biradari	Name of Farmer	Sr.
Tenent	Own	Sharing	Personal				NO
							1
							2
							3
							4
							5
							6
							7
							8
							9
							10
							11
							12
							13
							14
							15
							16
							17
							18
							19
							20
							21
							22
							23
							24
							25
							26
							27
							28
							29
							30

Extension Worker (**توسيع ڪارڪن**) Date: (**تاريخ**)

Attachment 6 Questionnaire for Baseline/Monitoring

Date :	
Village name:	
No. of Farmer:	
Name of the Farmer:	
Name of Observer:	

Category	No.	Question	Yes	No
1.Feeding Management（For milking buffalo/cow）Used of Improved Tie Method	1	Where tie animal daytime is same place as milking place?		
	2	Which body parts do you use to tie milking buffaloes/ cows?	☐ Full-face (*Muchi)*	
			☐ Neck	
			☐ Other parts	
	3	What kind of materials do you use to tie milking buffaloes/ cows?	☐ Rope	
			☐ Chain	
			☐ Others	
	4	Do you use enough length of tie materials to make buffaloes/ cows move freely to eat and drink?	☐ Enough	
			☐ Not enough	
2. Feeding Management（For calf）Provision of colostrum to calf at birth	5	Do you give colostrum to a calf within 6 hours after birth?		
3. Feeding Management（For calf）Prevention management against heat stress	6	Do you shower water over body of calves under 3 months ?		
4. Fodder（For calf）Hay making	7	Do you make hay and provide it to calves?		
	8	Do you give water to calves?		
5. Feeding Management Clean water	9	What is the water source ?	☐ Hand pump	
			☐ Canal	
			☐ From outside	
			☐ Others	
	10	How do you give the water to milking buffaloes/ cows?	☐ Water trough or Manger	
			☐ Bucket or Washtub	
	11	(if answer is water trough or manger) Do you wash a water trough (or manger) at least once a week?		
6. Fodder Cleaning of feeding trough	12	Do you throw leftover away and replace with new feed?		
7. Feeding Management（For milking buffalo/ cow）Body Condition Score "BCS" for milking cow	13	Do you check nutrient condition of buffaloes/ cows by their body condition?		
	14	Do you know BCS for buffaloes?		

Attachment 7 Farm Observation Sheet for Baseline/Monitoring

Date :	
Village name:	
No. of Farmer:	
Name of the Farmer:	
Name of Observer:	

Sr. no:	Description	Item	Remarks
1	Simple roof for milking buffaloes/ cows	Roof availability	☐ Available ☐ Not available ☐ Tree
		Shade	☐ Enough ☐ Not enough
2	Farm ventilation	Air circulation	☐ Four-side open ☐ Three-side open ☐ Two-side open ☐ One-side open
		Roof height	☐ More than 8-9 feet ☐ Lower than 8 feet
3	Floor space	Floor area	☐ Enough ☐ Just size ☐ Narrow
4	Clean and dry floor	Floor Cleanness	☐ Very clean (No dung, no urine, no leftover) ☐ Clean (Something is remaining on the floor.) ☐ Dirty (There are dung, urine and leftover.) ☐ Very dirty (Much of dung, urine, leftover are remaining on the floor.)
		Floor Condition	☐ Very wet ☐ Wet ☐ Dry
		Surface	☐ Smooth (Bare ground, Cemented, Proper arrangement of bricks) ☐ Not Smooth (Pit, Improper arrangement of bricks.)
5	Clean water	Water availability	☐ Clean water ☐ Dirty water ☐ No water
6	Availability of water trough and its cleanliness	Water trough availability	☐ Available ☐ Not available
		Water trough Cleanness	☐ Very clean ☐ Clean ☐ Dirty (There are fungus.) ☐ Very dirty
7	Availability of feeding trough and its cleanliness	Feed trough availability	☐ Available ☐ Not available
		Feed Trough Cleanness	☐ Clean ☐ Dirty (There are left over.) ☐ Very dirty (There are mold.)
Presence of animal			☐ Present ☐ Absent (If present, observe the following questions 9, 10, 11.)
8	Tie Method	Body parts for tie	☐ Full-face (*Muchi*) ☐ Neck ☐ Other parts
		Materials	☐ Rope ☐ Chain ☐ Others
		Length	☐ Enough (Easy access to the feed and water) ☐ Not enough
9	BCS of animal	BCS	☐ Less than 1.5 ☐ 2.0 ☐ 2.5 ☐ 3.0 ☐ More than 3.5

Attachment 8 Farmer Training Program (Feeding Management)

Time: 90 minutes

1. Training program

S. No	Time	Program	Note for facilitator
1	5minutes	(1) Holy Quran (2) Introduction of team and Participants	-
2.	5 minutes	Introduction of feeding management training	• Explain overview of this training session.
3.	25minutes	Question and explanation with material (1) Green grass (2) Dry grass (3) Roughages (4) Concentrate (5) Water (6) Feeding table of roughage (7) Feeding table of concentrate (8) Good examples and bad examples (9) Introduction of formula feed	• Ask question to the participants and use training material to explain
4.	25minutes	Measure the fodder of animals	• To measure the green and dry fodder for animals
5.	25minutes	Questions and Answers	• Extra questions from the participants will be discussed here.
6.	5 minutes	Closing	-

END

Attachment 9 Farmer Training Program (Livestock Management)

Time: 90 minutes

1. Training program

S. No	Time	Program	Note for facilitator
1	5minutes	(1) Holy Quran (2) Introduction of team and Participants	-
2	10 minutes	Revision of Previous training	
3.	5 minutes	Introduction of livestock Management	
4.	25 minutes	Explanation about material	
5.	15minutes	Farms Visit	• Visit of different farm of the farmer
6.	15minutes	Questions and Answers	• Extra questions from the participants will be discussed here.
7.	5 minutes	Closing	-

End

Attachment 10 Farmer Training Program (Animal Health)

Time: 90 minutes

1. Training program

S. No	Time	Program	Note for facilitator
1	5minutes	(1) Holy Quran (2) Introduction of team and Participants	-
2.	10 minutes	• Review of last training	
3.	5 minutes	• Introduction of Animal Health training	
4.	35 minutes	• Livestock Contagious Disease and its prevention • Livestock Non-Contagious Disease and its treatment • Livestock Parasitic Disease • Livestock Reproductive Disorder • Livestock Mineral Deficiency disease	
5.	10 minutes	• Prevention from Contagious Disease (Vaccination) Chart • Prevention of Parasitic disease (drenching and Deworming) Chart	
6.	10 minutes	• Disease scoring activity through proportional pilling (prevalence and importance)	
7.	10 minutes	Question and Answer by the farmer	
8.		Closing	-

END

Attachment 11 Farmer Training Program (Mastitis)

Time: 90 minutes

1. Training program

S. No	Time	Program	Note for facilitator
1	5 minutes	(1) Holy Quran (2) Introduction of team and Participants	-
2.	10 minutes	Review of last training	
3.	5 minutes	• Introduction of Mastitis	
4.	35 minutes	• Factor effecting Mastitis • Which animal is effected in Mastitis? • Symptoms of Mastitis • Preventive Measure and Losses of Mastitis	
5.	25 minutes	• How we detect Mastitis through test (Demonstration) • Experiment practice by farmer	• By experiment
6.	10 minutes	Question and Answer by the farmer	
7.		Closing	-

END

Attachment 12 Farmer Training Program (Body Measurement and BCS)

Time: 90 minutes

1. Training program

S. No	Time	Program	Note for facilitator
1	5minutes	(1) Holy Quran (2) Introduction of team and Participants	-
2	10 minutes	Revision of Previous training	
3.	5 minutes	Introduction of body condition score and measurement	
4.	30 minutes	Explanation about Material	
5.	30 minutes	Body Condition score at farm	Different buffalos' examination
6.	15minutes	Questions and Answers	• Extra questions from the participants will be discussed here.
7.	5 minutes	Closing	-

END

Attachment 13 Farmer Training Program (Reproduction and Genetics)

Time: 90 minutes

1. Training program

S. No	Time	Program	Note for facilitator
1	5minutes	(1) Holy Quran (2) Introduction of team and Participants	
2	15 minutes	Revision of Previous training	
3.	5 minutes	Introduction of Estrus and conception	
4.	5 minutes	Find the result after discussion with farmers.	
5.	30 minutes	Estrus and conception	
6.	15minutes	Questions and Answers	• Extra questions from the participants will be discussed here.
7.	5 minutes	Closing	-

2. Training material list

- Pena flex for Reproduction
- Reproduction calendar

END

Attachment 14 Farmer Training Program (Calf Rearing)

Time: 90 minutes

1. Training program

S. No	Time	Program	Note for facilitator
1	5 minutes	(1) Holy Quran (2) Introduction of team and Participants	-
2.	10 minutes	Review of last training	
3.	05 minutes	Introduction of Calf Rearing	
4.	15 minutes	• Natural Method of calf rearing • Why Artificial Rearing of Calf is necessary • How artificial rearing of calf carried out?	
5.	20 minutes	Hay making for calf and Check body condition score	• By experiment
6.	10 minutes	Question and Answer by the farmer	•
7.		Closing	-

2. Training material list

- Pena flex for Calf Rearing
- Hay making material for demonstration
- Equipment used for artificial rearing (Tincture iodine, feeders, milk bucket, cotton, small trough for feeding and watering, etc.)

END

Attachment 15 Farmer Training Program (Marketing)

Time: 80mintutes

1. Training Program

No.	time	Program	Note for facilitator
1	3 minutes	(1) Holy Quran (2) Introduction of team and participants	
2	2 minutes	Introduction of Marketing training	● Explain overview of this training session.
3	15 minutes	Explanation with material ➔ See contents of training material	● Use training material to explain
4	10minutes	Questions from Farmer and answer	● Answer the questions from the farmers
5	20 minutes	**Exercise:** Network diagram for Marketing ➢ Milk ➢ By-product	● Find out following points about milk and by-product selling using by network diagram (1) Selling channel (middleman, shop etc.) (2) Selling price (rupees per kg) (3) Selling volume
6	10minutes	Success story of farmer regarding milk selling	● Success story of should be selected according to situation of village by case study
7	15 minutes	How farmer improve resource of selling and continue their action	● Seasonal change should be considered
8	10minutes	Questions from Farmer and answer	Answer the questions from the farmers
7	5minutes	Closing	

End

Attachment 16 Training Participants list

تربیت ۾ شموليت لاءِ فارم (Registration Farm for Training)

ڳوٺ جو نالو (Name of Village) هاشم برفت

تعلقو (Taluka) تندو الهيار

ضلعو (District) تندو الهيار

ربيت لاءِ ڏينهن (Day for training)

ربيت لاءِ جاءِ (Venue for training)

تربيت جو وقت (Time for training)

نمبر	پاڻي جو نالو	برادري	پاڙا	FM (Date)	LM (Date)	AH (Date)	Mastitis (Date)	BCS (Date)	CR (Date)	RP (Date)	Marketing (Date)
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											

Attachment 17 Question Guide for Follow-up

Feeding Management

Q1: Do you remember what is good feeding for animal?

Q2: What kind of feed is used to increase milk production in milking animals?

Q3: What is the benefit of green grass?

Q4: What is the benefit of dry grass?

Q5: Why we should feed chopped grass to animals?

Q6: What is the importance of concentrate ration?

Q7: (If Possible) why 24 hours availability of water is necessary?

Q8: How many times do you give water?

Q9: What should you give to animal to keep body condition good and improve milk production?

Q10: Why the use of feeding trough is necessary for feeding?

Q11: How much quantity of concentrated ration is used for buffalo before/ after parturition?

Livestock Management

Q1: What is the proper method to tie the animal?

Q2: What is the importance of bathing?

Q3: What is the importance of grazing?

Q4: What is the benefits for hoof cutting?

Q5: What is the benefits of farm cleaning?

Q6: What is the suitable environment for enhancing milk production in animals?

Q7: What are the side effects to restrict animal from grazing?

Animal Health

Q0: How do you recognize your animal healthy or sick?

Q1: What are Livestock contagious disease? Its type in animals.

Q2: What are the symptoms of FMD?

Q3: What are the symptoms of HS?

Q4: What are the preventive measures against contagious disease?

Q5: What are non-contagious disease in livestock animals?

Q6: What are parasitic disease?

Q7: How many times you drench your animal in a year?

Q8: What you should not do before and after drenching?

Q9: What are the reason of mineral deficiency disease in animal?

Mastitis

Q1: What is the causes of mastitis if milking animals?

Q2: What kind of losses famer and animal will get when there is mastitis in animal?

Q3: What is the importance to do surf test?

Q4: How often do you do surf test?

Q5: What is the proper position of fingers for milking?

Q6: What are the sign of Mastitis?

Q7: What should you do to avoiding your animal get mastitis?

Q8: What are the preventive measures against mastitis?

Q9: What is suitable condition of floor for milking animal?

Q10: If you find mastitis effected animal what you should do? Do you separately milking?

BCS

Q1: Why it is necessary to measure body weight of animal?

Q2: How to estimate the body weight of animals?

Q3: What is the importance to know about body condition score in buffalo and cattle?

Q4:What is the BCS for that animal (Look at real animal)?

Q5: If your animal is in BCS 2 condition the how to improve health/ body condition of that animal?

Q6: What kind of problem may caused if your animal in BCS 4.0 and more?

Reproduction and Genetics

Q1: What is the ideal BCS of conceiving?

Q2: How long does it take until next parturition?

Q3: How many years will be taken until first heat sign?

Q4: Do you know silent heat sign?

Q5: Do you know how long heat sign continue? What is the best period for breeding?

Q6: Do you record event of reproduction?

Q7: Do you know about characteristic of high milking capacity of cow/ buffalo?

Q8: Do you know about good characteristic bull?

Calf Rearing

Q1: Do you apply antiseptic to new born calf's ?

Q2:After parturition at what time feed colostrum to calf ?

Q3: What is the importance of colostrum?

Q4:If farmer practiced " Do you clean nipples?

Q5: Do you rear calf as artificial methods?

Q6:Do you give water to calf?

Q7:In hot season, How do you rear you calf?

Q8: Do you feed hay to calf's?

Q9: Do you know how to make hay?

Q10: can you recognize the calves body condition according to its nutritional level?

Milk Marketing

Q1: Do you sell milk?

Q2: What is the disadvantage of adulteration?

Q3: Do you produce bi-product and sell it?

Q4: Do you sell milk individual or group ?

Q5: What are the benefits of group milk selling?

End

Attachment 18 Questionnaire for Core Farmer Selection

Date:
Name of candidate farmer:
Village name:

1. What kind of topics were new for you?
2. Which practice of the appropriate technology are you using regularly?
3.Do you recognize any difference about your animal before and after practice?
4.Have you ever share your learnings to other farmers?
5. Are you willingly to share information to other farmers, if they ask?

Note

Attachment 19 Model Training Program for Core Farmer Training (3 days)

Day 1

Time	Contents	Facilitator
10:30am	Recitation of Holy Quran	Participants
10:35am	Definition of core farmer and Role of core farmer	Master trainer
10:40am	Explanation of feeding Roughage and concentrate , requirement for milking buffalo	Master trainer
10:50am	Roughage and concentrate, requirement for milking buffalo	Group Discussion by participants
11:50am	Explain importance of 24hours water availability	Master trainer
11:15am	Explain Importance of vaccine and drenching	Master trainer
12:00pm	Importance of vaccine and drenching	Group Discussion by participants
01:00pm	Lunch close	

Day 2:

Time	Contents	Facilitator
9:30am	Recitation of Holy Quran	Participants
9:35am	Review of previous day	Participants
09:50	Explanation of Mastitis test and preventive measures	Master trainer
10:20am	Explanation of Mastitis test and preventive measures	Role play participants
10:50am	Explanation of animal farm and cleaning of farm	Master trainer
11:10m	Animal farm and cleaning of farm	Group Discussion by participants
12:00pm	Explanation of measure the heart girth and how to check from table	Master trainer
12:20pm	Measure the heart girth and how to check from table	Role play participants
01:00pm	Lunch Close	

Day 3:

Time	Contents	Facilitator
9:30am	Recitation of Holy Quran	Participants
9:35am	Review of previous day	Participants
09:50am	Explanation about reproductive issues and solution	Master trainer
10:30am	Reproductive issues and solution	Group Discussion by participants
10:50am	Explanation about record keeping calendar and calving interval period	Master trainer
11:10pm	Record keeping calendar and calving interval period	Group discussion and role play
11:25pm	Explanation about calf rearing	Master trainer
12:00pm	Explain Importance of colostrum	Master trainer
12:30pm	Explanation about Milking chart for calves and Hay making	Group discussion and role play
01:00pm	Milk Marketing	Master trainer
01:30pm	Close	

End

Attachment 20 Monitoring and Evaluation Sheet of Extension Workers (ver.2)

Date: _____

Name of Village: _____ District: _____

Name of Facilitator: _____ Name of Assistant _____

1. Attitude / Behavior (Score: Very Good 5, Good 4, Average 3, Poor 2, Very Poor 1)

S. No	Items	Score	Remarks
1.	Introduction of team		
2.	Body language		
3.	Eye contact		
4.	Language		
5.	Voice quality		
6.	Involve all Participants		

2. Message Delivery (Score: Very Good 5, Good 4, Average 3, Poor 2, Very Poor 1)

S. No	Items	Score	Remarks
1.	Introduction of project		
2.	Accuracy of message		
3.	Complete every item		
4.	Understandable way		
5.	Proper utilization of material		

3. Management (Score: Very Good 5, Good 4, Average 3, Poor 2, Very Poor 1)

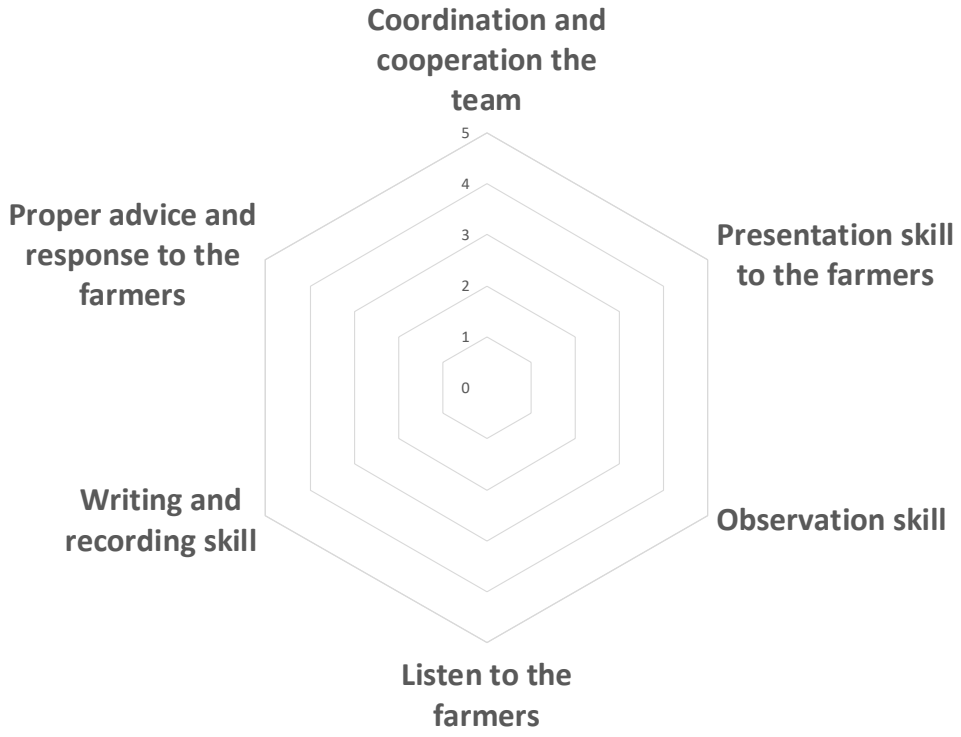
S. No	Items	Score	Remarks
1.	Time Management		
2.	Team Involvement		
3.	Arrangement of the venue		
4.	Role and responsibility		

Reporting officer: _____

Attachment 21 Self Evaluation Sheet for Extension Team

Date:_____

Name:_____ District:_____



Index	Reason
Coordination and cooperation the team	
Presentation skill to the farmers	
Observation skill	
Listen to the farmers	
Writing and recording skill	
Proper advice and response to the farmers	