CHAPTER – II

REVIEW OF LITERATURE
CHAPTER - II

REVIEW OF LITERATURE

2.1 INTRODUCTION:

Indian agriculture is characterized by the ownerships of small land holdings. The small holdings are devoted to the subsistence food crops production and the small farmers inadequately fertilized and without irrigation can produce only one crop a year, which is turn keeps the farmers poor and provides no money to buy the fertilizers and better seeds needed to produce better crops. For half of the population of the nation life is a daily struggle, to find enough food to keep the family alive. For 300 million people in India poverty is a way of live.

Modern agriculture is highly technical and capital oriented. In India, where 80 per cent of the farmers are small holders, agriculture should be supplemented with the subsidiary occupation such as dairying, poultry, sheep rearing, cattle breeding etc. There are enough evidences to show that the ‘Green Revolution’ has benefitted the big land holders who have the irrigation facilities and enough financial resources for the purchase of technical inputs which are the essential ingredients of new technology responsible for the Green Revolution. The recent research studies revealed the fact that dairying can help the country to achieve what had not been possible to do through the spread of the Green Revolution for the small and marginal holders and the land–less laborers’. Unlike the cultivation crops, progressive dairying not only places the medium and big farmers into more advantageous position but also increases the income of the small farmers and land–less laborers’ to a remarkable extent.

In Maharashtra Dairy farming is developed with the help of co-operative movement the main intention of the co-operative dairy in Maharashtra was to provide and attractive and alternative means of development to majority of farmers including large and small farmers as well as to the land less labourers. The shifting strategy in early sixties from dairying as an enterprise in a colony to a farm footing in rural development of Maharashtra. In 1960-61 There are
four hundred fifty milk societies in Maharashtra, which are increased 31294 in 1990-91 during the same period 36 milk co-operative projects in the state and 112 chilling plant.

At present co-operative dairy farming gives more potential and subsidiary income sources as about 50 lakh person in Maharashtra State Sangli is one of the important district in dairy farming. There are three Major milk co-operative projects in Sangli district as well as one government project and three private milk projects in village level .There are three to four milk collecting centers. In each village Co-operative movement diffuses all over district and it helps to the development of dairy farming in Sangli districts. To study the geographical analysis of development of dairy farming in Sangli district of Maharashtra the present research work has been selected. There are so many authors who studies on dairy farming and its development and also concluded their conclusions. Some of research articles are used in review.

Sandor kalmar,(2003) Studied on “Some Aspects for Raising of Economic Competitiveness of Dairy Farming” During his study be found

In Hungary the last decade the number of cattle stock practically has diminished 50% because of the unfavourable economic conditions. This fact and the nearing joining to EU reflect the important for developing dairy farming in the knew circumstances. Theoretically the over production is favourable for the profitability, because of the decreasing of the specific stable cost. Unfortunately, this way is closed for the Hungarian dairy farming because of the quota system. Raising of the milk quality is more possible and real way for raising of the economic competitiveness in the milk farming, especially in lower classes. In connection profit, price and cost it can be said, that the production cost of milk is lower at the private farms, but the milk price is higher at company farms every year. This means, that private farms are responsive to cost (more economical production, adaptation to environment, etc.), and the companies are responsive to price (higher milk quality, technical level, etc.). The two opposite tendencies result in higher income at private
farms. The production cost, of course, depends on a lot of factors (labour, technology, keeping, etc.) but the feed cost plays decisive role. The feed cost variation is 2-3 times more than the average milk cost variation, so we can say, that environmentally adapted milk production throw the feed cost will play decisive role in milk economics. This fact especially will be true in the next quota system and guaranteed price! Purpose of the investigation was to examine some opportunities for raising of competitiveness of dairy farming.

P.T.Gangasagare and L.M.Karanjkar.(2009) They work on “Status of milk Production and economic profile of dairy farmers in the Marathwada region of Maharashtra”

The investigation was conducted to review the situation of dairying in Marathwada with the objectives to study various trends of milk production and socio-economic status of the dairy farmers. The survey work was carried out for the milk pocket areas of eight districts of Marathwada region. About 59 per cent of the dairy farmers belong to general (unreserved) category, 25 per cent were backward class and only 8 per cent each of SC and S.T. The landless dairymen equally contributed with dairymen having (large) land; 13 landless dairymen reported comparable lactation yield with 08 dairymen holding 10 ha land. The significant differences among the means indicated that as the number of milch animals increased, the herd lactation performance decreased. The animals maintained by joint family were not properly cared for while they were cared properly by single family.

Landless dairy farmers of Marathwada equally contributed for milk production with those having land. Increase in the herd size decreased the productivity; the members of single family maintained the dairy animals more carefully than those of joint family.

Durgga Rani V. And Subhadra M.R. (2009) carried out research on “Training needs of farm women in dairy farming”

The study was conducted in Thrissur taluk of Thrissur district to assess the training needs of farm women engaged in dairy farming. It was
found that out of the five major farm operations studied, the farm women needed training the most in housing. The minor operations preferred the most for knowledge need were proper design of cattle shed, selection of breeds, compounding balanced feed using locally available ingredients, vaccination and banking and insurance. As for skill need, construction of scientific low cost cattle shed, selection of breeds, compounding balanced feed using locally available ingredients, symptoms of common diseases and banking and insurance were preferred the most.

Madhuri Oruganti,(2011) work in “ Organic Dairy Farming – A New Trend in Dairy Sector”. And concluded that the Organic Dairy farming means raising animals on organic feed (i.e. pastures cultivated without the use of fertilizers or pesticides), have access to pasture or outside, along with the restricted usage of antibiotics and hormones. Products obtained from Organic dairy farm are the organic dairy products. Organic farming is a system of production, a set of goal-based regulations that allow farmers to manage their own particular situations individually, while maintaining organic integrity. In this article, the benefits, conditions required, constraints involved, and management practices of organic dairying, along with information about the regulatory authorities concerned with the organic dairy farming were reviewed briefly to make students and farmers aware of organic dairy farming.

Shivakumar K. Radder and S.K. Bhanj,(2011)They work on “Perceptions of Dairy Farmers of Gadag district in northwestern part of Karnataka state, India regarding Clean Milk Production”.

Clean milk production is one important aspect in enhancing the quality of milk. It is important to know farmers' perception about it. With this view, present study was undertaken with the objective of understanding perception of dairy farmers about clean milk production. The study was conducted in six villages of Gadag district of Karnataka state. A total of 180 respondents were interviewed. Perceptions of the farmers regarding family manpower involved in dairy farming, personnel involved in milking, dairy income, intention to
produce clean milk, price dependence for following clean milk production, reasons for following cleanliness measures in milk production, sale price received for milk and satisfaction for the price they received for milk were studied. Most of the dairy farmers expressed their willingness to follow clean milk production measures. Further, most of them were ready to follow such measures even if they were not paid more price for milk. Farmers practiced clean milk production measures mainly to follow regulations at the dairy co-operative society followed by to avoid spoilage of milk. Dairy farmers largely neglected impact of cleanliness on animals' udder and health, about milk contamination causing health hazards. Milking was mainly a domain of women. For over 80% farmers, dairy farming provided a moderate income as portion of their total family income. Majority of the producers were not satisfied with price they were getting for milk. Hence, the study recommends, requisite facilities and guidelines from the agencies concerned are needed to be provided to the dairy farmers to adopt clean milk production practices. Proper education to the farmers regarding importance of clean milk production from health, marketing and animal health point of views needs to be given. There is need to give more importance to women in dairy farmers' trainings. The study also suggests offering satisfactory price for milk to hasten the process of adoption of clean milk production practices by the dairy farmers.

Dairy farmers largely neglected impact of cleanliness on animals' udder and health. They also did not seem to know about milk contamination causing health hazards. However, majority of them inclined to follow clean milk production measures. Requisite facilities and guidelines from the agencies concerned are needed to be provided to the dairy farmers to adopt clean milk production practices. Hence, the study suggests for proper education to the farmers regarding importance of clean milk production from health, marketing and animal health point of views. Milking was mainly a domain of women. The study suggests giving more importance to women in dairy farmers training. Majority of the producers were not satisfied with price they were getting for
milk. The study also suggests offering satisfactory price for milk to hasten the process of adoption of clean milk production practices by dairy farmers.

Azam MA, Khan MKI and Das A.(2012) They work on “Adaptability and Survivability of Different Crossbreds cattle under Commercial Dairy Farming Conditions in Chittagong area”.

The present study was undertaken to investigate the adaptability and survivability of different crossbred dairy cows under commercial farming conditions in Chittagong, Bangladesh. Different cattle genotypes (Holstein × Local, Sahiwal × Local, Sahiwal × Holstein and Jersey× Local) were found in the studied farms. The percentages of Holstein × Local was (58.94%) higher than other genotype. The survivability of Holstein × Local, Sahiwal × Local, Sahiwal × Holstein and Jersey × Local calves were 84.0±3.90, 100, 97.1±5.48 and 100 percent, respectively. The survivability of calves and cows were significantly different (P<0.05) among genotype. Survivability of bull-calves and heifers were similar for all the genotypes.

From the present study, it was found that farmers in Chittagong area reared cows with Holstein genetics in higher proportion than other genotypes. Holstein genetics remain longer period within the herd than other. The survivability of Sahiwal × Local and Jersey × Local crossbred calves were found to be higher. In spite of the lower survivability of Friesian × Local crossbred calves farmers of Chittagong region kept this crossbred more in number due to higher milk production and availability of replacement heifers than local and other genotypes. From this study, it can be recommended that Holstein× Local crossbred could be good option for future selection of cattle rearing in Bangladesh perspective. The main limitations of the study were small number of records per genotype that affected the results of the study. Therefore, further studies with higher sample size are recommended.

The present study was conducted purposively in Satara district of Maharashtra to ascertain the motivating factors perceived by farmers and contractor under contract dairy farming. The district was having the highest number of contract dairy farmers being engaged with the Govind Dudh Phaltan constituted the population for study. An interview schedule was developed by incorporating variables required for the study. The data after collection, compiled, tabulated and analyzed by using the appropriate statistical method. The study revealed that medium to high access to inputs, credit, marketing facility, production reliability and shared risk, guaranteed and fixed pricing structure and skill transfer among the contract farmers were the major dimensions contributed towards adoption of improved dairying practices under contract dairy farming. The contract dairy farmers were having access to various services such as milk cooler, clean milk campaign, community milking parlor, feed production, feed provision through contract, feed processing by raw materials, mineral mixture production, health facilities, vaccination, deworming, annual animal management service, animal breeding improvement program etc. under contract farming. Also they had access to various technologies such as loose housing system, silage making, urea treatment, farm technologies, seeds of improved fodder etc. under contract farming.

The contracting firm was providing various input facilities, services and new technologies under contract dairy farming regarding dairy production practices to contract dairy farmers. The motivating factors perceived by contract farmers were various facilities such as different type of inputs, credit, marketing facility, production reliability and shared risk, guaranteed and fixed pricing structure and skill transfer to contract farmers under contract dairy farming. Also various services such as milk cooler, clean milk campaign, community milking parlor, feed production, feed provision through contract, feed processing by raw materials, mineral mixture production, health facilities, vaccination, deworming, annual animal management service, animal breeding improvement program etc. and various technologies such as loose housing
system, silage making, urea treatment, farm technologies, seeds of improved fodder etc. Also majority of contract farmers strongly agreed that contracts provide access to new technologies, facilitate planning of activities, reduce price risks, facilitate coordination with suppliers and buyers, and reduce sales risk and lower search costs for markets. Such motivating factors perceived by contract dairy farmers were responsible for adoption of good dairying practices under contract dairy farming to boost milk production and improve standard of living.


Fuzzy data envelopment analysis (FDEA) model was used to solve the ranking problem of dairy farms for milk production in Iran with $\alpha$-cut approach at eleven $\alpha$-levels. It is widely accepted that measuring precise data for production systems cannot show the real situations; to overcome this shortage, fuzzy data envelopment is of great interest, especially in efficiency assessments which data errors are important. Different energy inputs including fossil fuels, electricity, machinery and equipment, human labour, feed and water were considered as input factors and energy output (including milk and cow manure) was the output parameter in determining the efficient units. The total energy consumption was 53.1 GJ cow-1 and the top two energy consuming inputs as feed intake and fossil fuel drew the fact that promoting input utilization efficiency seems critical. The benchmarking process indicated that 24 farmers from the 50 target dairy farms are efficient. Two units were known as sensitive units to fuzzy situation. Also, units were ranked according to their efficiency score. This study showed that FDEA can be quite useful for ranking purposes in agriculture using imprecise energy data.

To deal with imprecise data, fuzzy set theory has been introduced as an approach to quantify imprecise and vague data in DEA models. Using fuzzy
mathematical programming methods such as fuzzy linear programming, fuzzy DEA models can be typically solved and exploited for the ranking of enterprises. In this paper, a possibility programming approach for solving fuzzy DEA models has been developed and was shown to provide a simple and beneficial method of ranking in case of fuzzy data.

In this study, a farm’s efficiency score at different possibility levels was derived applying FDEA approach involved with imprecise data. The results from FDEA model using $\alpha$-cut approach showed that the closer $\alpha$ approaches 1 the greater the level of possibility and the lower the degree of uncertainty is. For instance, the efficiency scores for Farm 2 at $\alpha$-cut level $=1$ in BCC model was 0.674. This deterministic case assumes precision in measurement. 24 farms remain technical efficient at all $\alpha$-cut levels. Farms 19 and 47 became technical efficient at the extreme $\alpha$-cut level $=0.7$. The results of this research showed that the model developed in this paper is applicable to evaluate the dairy farmers’ efficiency in the view of energy consumption and would be interesting to dairy farm managers and policy makers to compare their technical efficiency compared to other units. As a result of this study, it was concluded that 24 dairy farms out of 50 selected farms were efficient. So, in the view of this, the following recommendations are deduced:

1. According to what energy use pattern analysis showed, a significant share of energy consumption has been assigned to unstandardized feeding rations. Having more control on that would lead in less energy use and cut costs, as well.

2. Improving machinery and equipment use efficiency by substituting newer equipment instead of obsolete ones, regarding the fact that fossil fuels and electricity is consumed by them.

3. Applying cleaner energy resources such as biogas and solar energy is strongly recommended.
4. Finally, integration of other methods such as fuzzy regression and analytical hierarchy process (AHP) with DEA can be applied as a benchmarking tool and improving energy efficiency.

Dande K. G. and Gaikwad S. M.(2012) He work on “Cost of Milk Production of Baif an Established Dairy Farm in Latur City. During his study be find,

The present investigation was carried out to study the cost of milk production on this BAIF farm in Latur. An established farm of BAIF is located on west side of Latur. It was observed that total $ 0.932 spent for production of seven litres of milk per day per cow. Therefore for the production of one litre of milk average of $ 0.133 spent. The price recovered for one litre of milk was $ 0.2 in this way net profit from one litre milk got $ 0.067.

The cost of milk production on this farm found optimum as it corroborates with other findings. But major problem is that this farm have very few numbers of animals therefore it is unaffordable to owner to rare such productive animals. So finally it is concluded from this investigation that if farm run with large numbers of dairy animals the profit would have been increased more two to three times than the present profit.

Dr R.D. Deshmukh,(2012) He work on “ Dairy farming in India”,India is a country of farming. Cows and buffaloes are not only infrastructure part of farm but cow & buffaloes are important part of the life of human beings. Milk is total food of human lives. Today the population of India is near about 121 crores and each with farming, In Maharashtra small farmer having four to five acres of land is on large-scale. They are not only depending on farming but also on milk production business i.e. dairy farming.Therefore it is necessary to select dairy farm is as joint business with farming.

The need for promotion of dairy farming in India arises due to several considerations. Due to lakh of capital production of milk is very low which causes unemployment and under employment problem. The need of a dairy development arises due to two main reasons,which stand out prominently –
Supply of adequate quantity of milk at reasonable price to urban areas. To provide viable subsidiary occupation to unemployed rural poor so as to raise their income earning capacities.

The demand for milk is expected to rise rapidly due to two reasons.

a) Growth of population
b) Increase in Income

The growth of cattle population for the above period has been estimated to be very marginal. Hence the dairy farm must be developed. Dairy farming was not given due importance in the preindependence India. With the inception of planned economy, it realized that the promotion of dairying would not only contribute to the national health building but also create the substantial employment and income opportunities. It realized that for balanced development of dairy industry, the organized market of milk and milk product is a pre-requisite. This can ensure remunerative price of milk producer. As a result, much to attention given to the building up of liquid milk plants, milk schemes and milk product factories in major towns and cities. These attempts did not have any followup action and lakhs specificity in terms of programme planning and implementation. The above constraints in the livestock development have been done away through the introduction of planning in the post-independence period that emphasized a systematic and intensive approach.


Sweet sorghum (*Sorghum bicolor* (L.) moench) bagasse (SSB), a by-product obtained after juice extraction from the stalks of sweet sorghum was used as a sole roughage in the total mixed ration (TMR) at 50 per cent level and processed in to SSB chopped plus concentrate (SSBC), mash (SSBM) and expander extruder pellets (SSBP) and compared with sorghum straw (SS) based TMR in mash form (SSM). The effect of feeding processed TMR on feed
intake, nutrients digestibility, milk and milk constituent’s yield and cost of milk production was studied in 24 lactating graded Murrah buffaloes divided into four groups (average of 3.0 lactations and 450 kg body weight) in a complete randomized design and fed the experimental rations for a period of 150 days. The dry matter (DM) intake (kg/d), digestibilities of DM, organic matter, crude protein and nitrogen free extract and milk yield (kg/d) and total solids, solids not fat, milk fat and protein yield (g/d) were higher (P<0.05) in buffaloes fed SSBP ration while, comparable among SSBC, SSBM and SSM rations. The feed conversion ratio (kg/kg milk yield) and cost of feed per kg milk yield were lower (P<0.05) for SSBP ration and higher (P<0.05) for SSM ration. The present study indicated that replacement of SS with SSB in TMR decreased the cost of milk production by 22 % in buffaloes. Further, feeding of SSB based TMR in the form of expander-extruder pellets increased the milk production by 20% in buffaloes.

The results of the present study indicated that SSB may be used as roughage source in place of SS in TMR for economic milk production. Further, expander-extruder processing of SSB based TMR improved milk production feed efficiency and decreased cost of milk production compared to mash and chopped form of the same ration.

Shamsia S. M. and El-Ghannam M. S.(2012)They work on “Manufacture of Labneh from Cow's Milk Using Ultrafiltration Retentate With or Without Addition of Permeate Concentrate”.

Chemical composition, rheological properties and sensory evaluation of fresh labneh made from cow's milk, using ultrafiltration (UF) retentate and traditional process were investigated. Coagulation times showed a synergetic effect of addition of both GDL (1%) and permeate concentrate (1%) on coagulation time of labneh where the two components have been accelerated the acidity development. Consequently, the coagulation time becomes shorter. Addition of 1% permeate concentrate, 1% or 2% GDL already increased total solids significantly. Chemical composition of labneh showed that total solids,
total protein, soluble protein, fat, ash, acidity and pH were increased in labneh made from UF retentate comparing with that traditionally prepared. pH was higher in UF labneh although acidity content was markedly higher than that of traditionally prepared one due to the buffering capacity of high content of protein in retentate. Soluble protein content was trebled in UF retentate labneh. Lactose content was lower in UF labneh than control except those treatments where permeate concentrate was added. Texture profile test showed that a correlation between acidity, coagulation time and hardness may be exist. Results also showed that there is no definite correlations between the additions of permeate concentrate or GDL and springiness or adhesiveness of labneh. Addition of 1% permeate concentrate has lowered the cohesiveness values, while addition of 1% GDL had no effect. Values of resilience are consistent with those of cohesiveness. Wide variations were observed among treatments. Addition of 1% permeate concentrate to the UF labneh improved the appearance, consistency and flavor of produced labneh.

It can be concluded that the addition of 1% permeate concentrate to the basic formula of retentate labneh (retentate + 2% lactic culture) improved the appearance, consistency and flavor of produced labneh. Ozer and Robinson (1999), Mohmoud (1980), Omar and Buchheim (1986), Hagrass et al. (1986) and Hydamaka et al. (2000) reported that Labneh produced by UF concentration was the preferred option. They also reported that soft white cheeses made from cow’s milk by UF had a uniform and closed texture, good appearance and better organoleptic properties than the cheeses made by traditional process.


Milk quality appreciation parameters are not determined in Tunisia yet. Indeed, the variety of herds used, breeding systems and climatic conditions show a big variety of milk composition. The present study aims to quantify milk urea level from different Tunisian regions. Milk yields were recorded at
each milking from the tank. In total 310 samples were analyzed. The experiment covered 29 smallholders with different farming system and herd’s constancy, 08 collection centers, 13 milk peddlers and 05 typical dairy farms with an appropriate rationing. The urea level for all analyzed samples was 306 (12) mg/l. This level varied between 140 mg/l and 507 mg/l, with an average of 290 (84) mg/l, for smallholders. In dairy farms, the mean milk urea concentration was 305 (39) mg/l, urea value varied between 287 mg/l and 343 mg/l. In collection center and milk peddlers, average of milk urea was respectively 317 (81) and 313 (112). Height standard deviation value for smallholders and peddlers milk samples indicates changes in nutritional management, larger herd size and water supplementation. Milk urea level varies with production and farming systems. Monitoring milk urea values provides a practical way to control milk quality and dietary protein efficiency of dairy cows.

Milk urea level varies with production system and farming system. Maintaining and monitoring milk urea in dairy herds provides an opportunity to formulate the dietary protein constituency that optimizes nitrogen utilization for milk production and avoids possible negative effects on herd’s fertility and milk quality.

Biradar G. S., Gujar S. K., Dande K. G. and Gaikwad S.M. (2012) They studied on “Studies on Physico-Chemical Quality of Paneer (Indian Cheese) Papered From Blends of Soymilk and Buffalo Milk”.

Present investigation was undertaken to study the effect of blends of soymilk and buffalo milk on physicochemical qualities of paneer. The buffalo milk was standardized to 6% fat using buffalo skim milk. The soymilk and soymilk paneer was prepared from soymilk and buffalo milk formulations i.e. group L1, L2, L3, L4 and L5 containing 10, 20, 40 and 50 per cent soymilk respectively. It is observed from the present investigation that paneer prepared from blending soymilk with buffalo milk upto the level of 40% was improved
the qualities of final product and acceptable to the consumers though it has decrease the physical score for all the parameters.

From the results recorded in this study it can be concluded that paneer prepared from blending soymilk with buffalo milk up to the level of 40% was improved the qualities of final product and acceptable to the consumers though it has decrease the physical score for all the parameters. Addition of soymilk helped in improving nutritional quality particularly with respect to richness of ash without affecting the hardness of paneer.


A study on the standardization of *Ujani basundi* was carried out by using cow milk. Milk was standardized to 4% fat and 8.5% SNF (Solids Not Fat). The attempts have been made to study the effect of different levels of sugar (6, 8 and 10% w/w of original milk) and rate of concentration (2.5, 3.0 and 3.5X including sugar) on organoleptic and chemical quality of *Ujani basundi*. The results have indicated that the product prepared with 10% sugar level and 3.0X concentrated had optimum consistency, brown colour, pleasant flavour, with small flakes hence scored highest among all the treatments.

The *Ujani basundi* product is very popular product in Latur district of Maharashtra state but it is not standardized. The best product with optimum consistency and optimum sweet with characteristic brown colour can be prepared by using the standardized cow milk with 4% fat and 8.5% SNF by adding the 10% sugar and concentrating to 3.0X to its original total solids including sugar.


Pregnancy rates and economic outcome in dairy animals reared under tropical conditions were determined following progesterone (controlled internal drug releasing device; CIDR)- or gonadotropin releasing hormone (GnRH)-
based timed artificial insemination (TAI) protocol with GnRH or estradiol benzoate (EB) used as the ovulation synchronisation agents. Animals on the GnRH-based protocols were given GnRH (100 µg, i.m.) on day 0, prostaglandin F2α (PGF2α; 25 mg, i.m.) on day 7 and were given either GnRH (GnRH-G; n=55) or EB (500 µg, GnRH-E; n=40) 48 hours after. Animals on the progesterone-based TAI protocol received a CIDR insert for 7 days, PGF2α at CIDR removal, and either GnRH (CIDR-G; n=73) or EB (CIDR-E; n=55) 48 hours later. All animals were artificially inseminated, 60-72 hours after the injection of PGF2α and pregnancy was determined at 25-35 d after insemination. The mean pregnancy per timed artificial insemination (P/AI) was 38.5 ± 3.3% and was not affected by treatments. P/AI was higher in progesterone-based (43.6%) compared to GnRH-based (26.8%) protocols in heifers but not in cows (P = 0.1). The cost of treatment was greater (P < 0.001) for progesterone ($20.2) than GnRH-based ($11.1) TAI protocols. The mean added value was higher for heifers on progesterone-based ($119.8) than those on GnRH-based ($73.6) protocols (TAI protocol X parity, P = 0.09). Progesterone and GnRH-based TAI protocols can be cost effective approaches for increasing pregnancy rates in heifers and cows, respectively under tropical conditions.

Similar pregnancy rates to those reported in the literature for cattle bred in temperate regions using GnRH and progesterone/CIDR-based TAI protocols was observed in the small dairy herds in Trinidad. The first injection of GnRH given at the start of progesterone/CIDR-based TAI was not necessary to achieve acceptable pregnancy rates, and can be eliminated in order to reduce the overall cost of TAI protocols. Replacement of GnRH with EB as the ovulation synchronizing agent also does not alter P/AI and can further reduce the cost of the TAI protocol. In dairy cattle herds with poor reproductive performance as exist in the tropics, progesterone/CIDR and GnRH-based TAI protocols may be a cost effective approach of increasing pregnancy rates in heifers and cows, respectively.

In order to monitor the changes in heat dissipation through sweating and panting, oxygen consumption, heat production, heat storage, physiological responses (RR, RT and ST) and antioxidant enzymes status, five heifers of Murrah buffaloes were selected from herd and maintained under normal feeding and management followed at the farm. The animals were exposed to four exposure temperatures viz. 32, 35, 40°C with a constant relative humidity of 50% and sham control at 8.00am in a climatic chamber for three hours continuously. The pre exposure heat loss through skin ranged from 5433.49 ± 371.18 to 5749.63 ± 327.53 KJ/ hr. The heat loss through skin increased with the increase in climatic temperature (40°C). The maximum heat loss (8584.11 ± 262.48 KJ/ hr) was observed at III exposure conditions. The mean values of pre exposure pulmonary heat loss ranged from 528.26 ± 35.56 to 542.79 ± 14.6KJ/ hr. The percent increase in pulmonary heat loss over pre exposure values were greater at all the exposures compared to heat loss through sweating. The pre exposure oxygen consumption of heifers ranged from 1.38 ± 0.02 to 1.59 ± 0.01 litre/ min. The pre exposure values of oxygen consumption increased after three hours of exposure at all the exposure conditions. The levels of antioxidant enzymes (super oxide dismutase and catalase) showed a linear increasing trend with the increase in the temperature from 32 to 40°C in the climatic chamber. The sweating, panting, oxygen consumption, physiological responses and antioxidant enzymes levels increased significantly (P<0.01) during different exposures, intervals of exposures and their interactions. All the parameters also showed a significant (P<0.01) positive relationship with the temperature humidity index. The results of the study indicated that the heat stress had an adverse impact on physiological status of buffalo heifers. Therefore, buffalo heifers require a protection from heat stress at higher temperature (40°C) exposure for maintaining body temperature.
This paper examines the effect of recent economic recession on dairy sector. The changes in dairy production, consumption, trade and prices of milk, feed and value added dairy products have been examined for world as a whole and in the Indian context during 2000-06 (normal situation) and after 2006 (under economic crisis). The Indian dairy sector has witnessed some disquiet trends in terms of slow down in export performance, but, the price trends have not shown volatility similar to the international markets as the sector largely caters to the domestic market where demand is also positively influenced by factors other than income growth. In case of total demand for value added industrial dairy products, that have greater relationship with prevalent economic conditions, the effect of economic turndown is discernible in terms of declining import demand. The decline in exports, possible fall in domestic consumption of processed dairy products and declining trend in production of important dairy products may have adversely affected the economic performance of organized dairy processing sector in the country. In nutshell, under the existing dairy production system, as the synergy between international price trends and domestic production is somewhat weak, the susceptibility of dairy sector to current economic crisis has not been profound. However, the darker side of this implies that gains to the Indian dairy sector, especially the dairy farmers would be marginal once the world economy follows the recovery path.

The study was conducted in four villages of district Karnal namely Budhakheda, Kulwehri, Subhri and Ranwar, selected purposively. From each selected village, 30 respondents having at least one crossbred cow and one
buffalo were selected randomly to constitute a total of 120 respondents for the study. Data were collected with the help of a pretested structured interview schedule. Data were then tabulated and put to suitable statistical tests and conclusions were drawn. About 70 percent of respondents having small sized milch herd always vaccinated their animals against Haemorrhagic Septicaemia (HS) whereas 75 percent always vaccinated against Foot and Mouth Disease (FMD). 73.91 percent of respondents having medium sized milch herd always vaccinated their animals against HS, 89.13 percent always vaccinated against FMD. 72.22 percent out of the respondents having large sized milch herd always vaccinated their animals against HS, 61.11 percent always vaccinated against FMD. Study of the problem of repeat breeding revealed that 6.16 percent of the crossbred cows belonging to respondents having small sized milch herd were repeat breeders and 1.93 percent of the buffaloes were repeat breeders. Out of the crossbred cows and buffaloes belonging to respondents having medium sized milch herd, 7.52 percent and 4.93 percent were repeat breeders, respectively. Whereas, 13.80 percent of the crossbred cows and 10.31 percent buffaloes belonging to respondents having large sized milch herd were repeat breeders. Average age at puberty was higher in small crossbred herd size and the average peak yield increased with increase in crossbred herd size. Average age at puberty, average age at first calving, average service period decreased and the average peak yield increased with increase in buffaloes herd size.


This paper presents the impact of microcredit on return from dairy in Mewat. A sample of 60 members from 30 Self Help Groups and 30 non-members from three blocks of Mewat was drawn for the present study. In order to isolate the impact of credit assistance for dairy, ordinary least squares technique was employed. The average buffalo milk production per household
per day and productivity were found to be higher in case of member households than non-member households. The annual gross return from dairy was higher in member households in comparison to non-member households. The coefficient of credit dummy turned out to be positive and highly significant implying positive impact of microcredit on return from dairy.