APPENDIX

Best Paper Award

Best paper award was conferred to our research paper published in International Journal of Computer Sciences and Engineering entitled “A quantum inspired evolutionary computational technique with applications to structural engineering design”, Volume 5, Issue 5, 2017.

Website: www.ijcseonline.org/best_paper_award.php

Publications


Annexure A

Dairy Systems

A dairy system is a huge system which involve the areas like farm, business, environment, feed, animal, milking, and people. Description of each part is given below.

1. Farm

Dairy system can be considered as having different farm management information. They cover business, financials, farm systems, adverse events, and construction.

1.1. Farm watch

In farm watch, weekly summary of all the farms are observed and analysed.

1.2. Farm tune

This activity includes methods to do things easier, faster, better, and safer. Things observed under this head are

- Reduce milking time.
- Results should not depends on the person doing the job
- Get organised: Keep all items, tools etc in its proper place and plan in advance for things needed.
- Management process should improve the business continuously.
- Communication should improve and training has to become convenient and easy.
- Motivate the people to work with enthusiasm and cooperation.

1.3. Adverse Events

In this section, the dairy system takes care of flood, heavy snow, wet weather management, storms, drought, earthquake, power outages, managing stressed stock, missed milking, crisis priority checklist, volcanic eruption, managing stressed people, milk disposal as presented in Figure 1.16.
1.4. Off-paddock Facilities

Off-paddock facilities involves off-paddock facilities tool, managing facilities permanent feed pad, loose house barn- soft bedding material, loose house barn, free stall barn, and stand-off pad etc.

1.5. Tactics

Tactics provide tips for giving high nutritive feed in low cost. It provides help for pasture planning, budget studies, review dairy system.

1.6. Biosecurity

Biosecurity is another important part of dairy system, it provides protection against animal and plant diseases like pest plants such as velvetleaf, yellow bristle grass, pest insect like clover root weevil and animal pests –possums (can spread tuberculosis). Disease, pasture pests, weeds, and animal pests can have serious long-term financial and physical impacts on the cattle health and people working in farms. The main purpose of biosecurity is to reduce the risks of introducing, spreading pests and disease.
Good farm biosecurity agricultural practices must include:

- Prevent the farm from the disease and weeds
- Isolating sick animals.
- Introducing an effective herd health management programme.
- Working on good machinery, building, animal hygiene and pest control.
- Prescription of the veterinary doctor must be strictly followed.
- Managing the herd to increase disease resilience.
- Training the people appropriately.
- **Animal Identification** - This provides traceability of individual animals.

2. **Business**

Business involves different activities at different stages according to the priorities. In any type of business one should know how to succeed, planning for future, budgeting, business analysis etc. In dairy system, farm performance should be reviewed annually. Track progress towards short and long term goals. Draw comparison with other farms. Keep a tight rein on farm working expenses.

3. **Environment**

It is another important aspect of the dairy system. This section includes effluent, land, water, and nutrient management on dairy farms. All the above mentioned factors vary according to the environment or surroundings, where the dairy farm is established. According to the environment the food habits and nature of living of dairy farm animals are changed.

4. **Feed**

This is the most important part of any dairy system. It consists of information about feed management on dairy farms. The different areas of concern are: seasonal management, production system, crops and pasture information, supplements, and renewal.

4.1. **Seasonal Management**

It manages feed and pasture throughout all the seasons (Spring, Summer, Autumn, Winter) of a year. This section describes how to manage the feed and pasture including pasture management, surplus.
4.2. Pasture Renewal

Pasture renewal is a very important aspect of the feed. It improves the production and performance of land and livestock. The following Figure A.3 provides the steps of pasture renewal.

![Figure A.2 Pasture renewal system]

4.3. Pasture Management

Pasture management includes the areas given below.

- **Growing Pasture**: It gives the information about growing pasture including soil fertility, pasture requirement, pests, weeds and more.

- **Assessing and allocating pasture**: To manage pasture quality and quantity, it is necessary to assess pasture for accurate allocation.

- **Assessing farm performance**: Understand the farm potential and feed budging. These factors are useful for making the best decisions about feed management.

- **Feed wedges and rotation planning**: It includes feed wedges, spring rotation planner, autumn rotation planner etc.

4.4. Feed Management Tools
These tools help to manage feed. They are the spring rotation planner, cultivator selector tool, Autumn management tool, pasture growth forecaster feed budgets, comparative stocking rate, supplement price calculator, etc.

4.5. Nutrition

This part is meant to provide information about the nutrient requirement in dairy cows at various stages of lactation. At the same time, it should be cost effective. The nutrients required by dairy cows are energy, fibre, protein, water, vitamins, and minerals. Energy is the key driver of milk production. It determines milk yield, milk composition (fat and protein content), and body weight.

4.6. Supplements

It contains the information about the feed values of supplements in terms of metabolisable energy (ME), dry matter etc. Maize silage, grass silage and palm kernel extracts are also the part of supplements. It also gives the information about milksolid response to supplements fed in spring, summer, and autumn.

5. Animal

Animal management is a critical component of farm profitability and sustainability. This section covers all topics from genetics to herd management and more.

- **Animal Evaluation:** Animal evaluation aims to provide the tool for information about breed of animal.
- **Caring for Calves:** This ensures that every calf should receive the best start to life.
- **Animal Welfare:** It is the heart of any good dairy farming. This takes the responsibility for the wellbeing of animal’s whole life from the birth to end of life.
- **Cow Health:** This team provides the safety of cows from different diseases like lameness, heat stress, facial eczema, John’s disease etc.
- **Heifers:** As everyone knows that heifers represent the future of the dairy herd. How well heifers are grown and their body condition at first calving has a big impact on their reproductive performance and milk production. This section provides the key aspects to rearing heifers from weaning through first lactation.
6. Milking

Milking system includes dairy shed, workers etc in addition to the animals. Everything should work effectively and in balance. The milk quality and quantity can be improved by small improvements profitability. The following are the advantages of a good milk harvesting system.

➢ Cows are comfortable and it leads to faster milking and more milk.
➢ Reduction in cow health problems.
➢ Save the time of workers.

7. People

This department takes care of employee, employer, health and safety of people working in dairy, and more. Agriculture provides awesome career opportunities.

****The End****