Vol.12 No. 1, Page No. 100–106 (2023)
Received: February, 2023; Accepted: April, 2023

A study on Readability of User Friendliness of Dairy Mobile App

Arpita Sharma Kandpal
Govind Ballabh Pant University of Agriculture and Technology,
Pantnagar, Uttarakhand-263 145 India

Abstract

Livestock is an inherent component of Agriculture, both being intrinsically linked and complementing each other for overall food security. As an inevitable part of agriculture, the people from the time of its evolution consider livestock as one of the oldest traditional occupations in farming. With the help of social media instant feedback can be taken from farmers which will be able to reduce one way communication. Digital India is one of the best initiatives taken by the Government to ensure that all the facilities are available to all citizens electronically including delivering new techniques and information in the field of agriculture and dairy. The right information given at right time empowers the farmers and information is necessary for agricultural development. The most important function of information is to upgrade the level of knowledge to reduce uncertainties. Presently, wide range of Information and Communication Technology (ICT) platforms are being used to access and share agriculture, veterinary and animal husbandry information. Mobile app is also one of the Information Communication technology which provides right information instantly. Present research investigation was carried out in Pantnagar, Uttarakhand in 2022 to analyse the readability scores of dairy manager mobile app. To analyse the readability of mobile apps to tests were used: Gunning Fog Index and Flesh Reading test. The results revealed that overall readability score of dairy app calculated using Gunning Fog Index is 11.13. The index shows medium readability. This means farmers can understand this app. The overall Flesh Reading score was 58.7. This also shows medium level of readability.

Key words: *readability, dairy, mobile app*

Introduction

Livestock contributes around 16 per cent to the income of small farm households as against an average of 14per cent for all rural households. Over past decades, from the acute milk shortage to the World's leading milk-producing Nation India's transformation in the field of dairy is highly commendable but still the demand of the milk and milk product is lagging. As per the latest data given by National Dairy Development Board 2019, Milk Production in the country grew at 6.5 percent and to 187.7 million tonnes in 2018-19 as against 176.3 million tonnes in 2017-18. The increase in milk's per capita availability was around 394 grams per day.

In the present scenario, Information plays a major role in the advancement and sustainable growth of any sector[6]. Including it, effective communication is also necessarily required for making the community aware of interventions[1,2]. Many new high-yielding production technologies were revolutionized in recent decades by the hard work of researchers and scientists. Yet, there is a huge difference in the development of technologies and rapid transfer of the technologies. Mobile apps are one of the most important ICTs tools to solve the problems of dairy farmers by providing them knowledge, information and education on various aspects. Mobile apps should be easy to read so that farmers can take the information. Thus, readability should be checked for the mobile apps so that mobile apps can be modify as per the needs of farmers.

The clarity of written language can be quantified using readability formulas,

which estimate how understandable written texts[5]. Texts written at different times can vary in their readability: trends towards simpler language have been observed in US presidential speeches, novels and news articles. Higher fog index value of patient information and consent documents made it difficult for the target audience to comprehend the information easily[3,4].

Ways to improve the grade level reading requirement of a document are: [1] Delete unnecessary words and phrases. [2] Replace passive voice with active voice. [3] Change complex sentences into multiple, simple sentences. [4] Visual perception thinking is effective and efficient. Whenever possible, use figures and illustrations of all kinds. [5] Graphs are generally better than tables and numbers. [6] Make sure the reader is well oriented to what is being discussed and why. [7] Use appendices for providing detailed algorithms and proofs. People won't read what they can't understand. In a flourishing technical discipline like information systems, the difference between merely acceptable writing and truly good writing often is the difference between a manuscript that is read and one that is not. Thus, a high level of readability should be required of all papers submitted for publications in information systems type journals. Authors should realize that a high degree of readability does not mean avoiding the meticulousness approach to an article, or shunning the needed technical aspects that should be included.

For the purpose of this paper, readability is defined as the ease of understanding, or comprehension, based upon the style of writing. We are not measuring the ease of reading due to the pleasantness of writing or the legibility of print (typography).

Present research investigation was conducted with the objective of to analyse the readability of dairy management mobile app[6,7].

Materials and Methods

Dairy management app was purposively selected from Android Google Play platform for investigation. This app is extensively used in India. The ratings and app size was also kept in mind before choosing the app. Dairy Manager app was developed by IVRI. It was ensured that the chosen app was recently launched and provided information in English.

Gunning Fog Index (GFI) was used to test the readability. The GFI estimates the number of years of formal education required to understand the text on first reading. The fog index refers to a readability test that aims to determine the level of text difficulty or how easy a text is to read. The index provides a reader with the number of years of education that he or she hypothetically needs to understand and digest a particular text on the first reading. Selected app was studied and content map was generated for the same. The first step done was content mapping of the app which portrays sections and sub-sections clearly. The sub-sections with a high text volume was purposively selected.

Gunning Fog Index formula: 0.4 [(words/sentences) + 100 (complex words/ words)]. Or 0.4 (ASL+PHW).

To calculate the Gunning Fog Index, Apps was downloaded and a body of text with at least 100 words were selected from each app. The number of exact words and syllables were counted. Then, the total number of words in the sample was divided by the total number of sentences. This results in the Average Sentence Length (ASL). Next, the number of complex words were counted which were not proper nouns, combinations of

easy or hyphenated words, or two-syllable verbs made into three by adding -es and ed endings. Then, that number was divided by the total number of words in the sample passage. This gave us the Percent Hard Words/Complex Words (PHW or PCW). GFI scores range from 0 to 19^{+}. Scores of 0 to 6 correlate with low-literacy resources, 7 to 8 with resources comprehendible by junior high school students, 9 to 12 by high school students, 13 to 16 by college students, 17 to 18 by graduates, and 19 + by those with higher professional qualifications. GFI scores were computed for every section and then took an average for obtaining the overall readability score of the apps.

Table 1 GFI Scores

Fog Index	Reading level by grade
17	College graduate
16	College senior
15	College junior
14	College sophomore
13	College freshman
12	High school senior
11	High school junior
10	High school sophomore
9	High school freshman
8	Eighth grade
7	Seventh grade
6	Sixth grade

Flesch-Kincaid Test

Experts have developed methods for measuring how easy, or difficult, a text is to read. One of the best known is the Flesch-Kincaid index, which we can use to measure the readability of the articles. This index is the United States Government Department of defense standard and the Government has mandated its use by contractors when writing manuals for the armed services. We used WordPerfect to create text files and measure their readability index using Flesch Kincaid formula. The Flesch-Kincaid index is a numeric value between 6 and 20. The more difficult the reading of the text, the higher the index number is. The procedure is designed to assess the grade level of education needed to read and understand the material.

Results and Discussion

The present study operationalizes readability as the ease with which dairy farmers, and other users of dairy farming mobile apps can comprehend the written text portions in the dairy mobile apps.

Readability of Dairy Management App through calculation Gunning Fox Index: Table 1 throws light on the individual section and overall readability scores of dairy management app[8]. There are ten sections having sub sections in this app. Ten sections are in this app are: Breed Suitable for commercial dairy farming, Housing management, Feeding Management, Calf Management, General management, Clean Milk production, Animal Identification, Vices in dairy animals, Videos on scientific practices.

The first section Breed Suitable for commercial dairy farming was again divided into six sections viz.; Cattle breeds, Buffalo Breeds, Exotic Breeds,

Crossbred breeds, Reproductive problems and its solution, Artificial insemination. Now Cattle breeds included the brief description of five breeds viz; Sahiwal, Red Sindhi, Gir, Tharparkar, Deoni. Buffalo breeds included Murrah, Nili Ravi, Surti, Mahsana, Bhadawari, Exotic breeds included Jersey, Holstein Friesian, Brown Swiss, Red Dane.

The second section Housing Management includes selection of sites, types of housing system, house specifications, cleaning and disinfection. Types of housing system includes two sub sections: Conventional housing system, loose housing system. Conventional housing system includes single and double row. Loose housing system includes floor space requirements under loose housing system and manager/ water trough dimensions (cm). House specifications includes four sub sections flooring, roofing, height of the roof, other specifications. Flooring includes types of floor material. Roofing includes types of roofing materials.

The third section Feeding Management includes type of feed ingredients, dry matter requirement, feeding schedule, tips for feeding dairy cattle, fodder preservation. The subsection type of feed ingredients includes concentrate, roughages and straws. Fodder Preservation includes Hay, Silage, Haylage. Hay includes crop suitable for hay making, Kay making, Kinds of Hay. Silage includes Crop suitable for silage making, requirements of a silo, Silage making.

The calf management includes immediate health care, feeding, housing, climate stress management, calf rearing, disease prevention and Veterinary aid and other important practices. Feeding includes feeding schedule of calves up to 3 months of age, feeding schedule of calves from 3 months to 6 months, feeding schedule from 6 months to 12 months. Climate stress management includes heat stress and cold stress. Calf rearing includes Natural suckling and weaning. Disease prevention and veterinary aid includes scours, pneumonia, septicaemia and parasites.

The general management includes signs of good health, care and management, Ameliorative measures during summer and winters, de worming schedule, vaccination schedule, some important diseases. Care and management includes during pregnancy, before calving, during calving, post calving. Ameliorative measures during summer and winter includes two sub categories summer and winter. Deworming schedule includes types of anthelminthic and deworming schedule. Some important diseases includes metabolic diseases and viral and bacterial diseases.

Clean Milk production includes clean milk, importance of clean milk, steps in clean milk production.

Animal identification includes types of identification methods and commonly used identification methods.

Vices in dairy animals includes bar biting, tongue rolling, eye rolling.

Videos on scientific practices includes clean milk production, Neonatal calf management and urea molasses mineral block.

Gunning Fog Index

The Gunning Fog Index was developed by Robert Gunning Associates. This index ensure clarity and simplicity. Out of ten sections, only four sections were considered for calculating GFI Scores. The highest readability score of 13.23 was recorded for information related to calf management followed by 11.32 was recorded for information related to Housing management and for feeding

management score was 10.95. For disease prevention and veterinary aid score was 11.40.The scores ranged between the reading level categories of high school sophomore to college sophomore. The overall readability score of Dairy Manager App is 11.13which comes under the reading level of high school junior. SD value is 1.3. The index shows medium readability. This means farmers can understand this app.

Table 2 Gunning Fog Index

S. No.	Areas	Scores
1	Calf management	13.23
2	Housing management	11.32
3	Feeding management	10.95
4	Prevention and veterinary aid	11.40
5	Breed Suitable for commercial dairy farming	11.01
6	General management	12.75
7	Animal identification	11.34
8	Vices in dairy animals	10.16
9	Overall Readability	11.13

***Readability of Dairy Management App through calculation Flesh Kincaid test*:**

The overall Flesh Reading score was 58.7. This shows medium level of readability. The estimated reading grade level was 10^{th} to 12^{th} grade means high school. The analysis of the readability of agricultural or animal husbandry mobile apps using Gunning Fog Index gives the overall scoring at a reading level of high school. Although the value is lesser than 12 which is required for easy and better understanding of a wider audience.

Table 3 Flesh Kincaid test

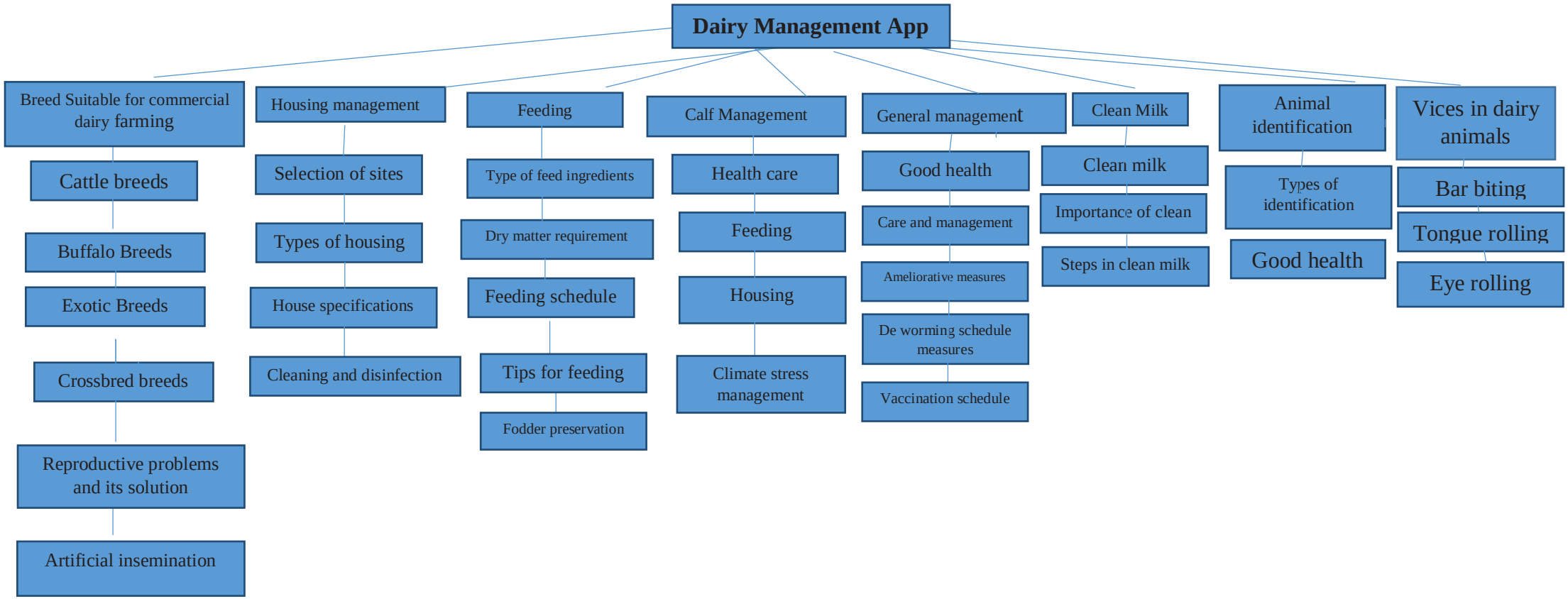
Score	Estimated Reading Grade Level
90 to 100	5th grade
80 to 90	6th grade
70 to 80	7th grade
50 to 60	10th to 12th grade (high school)
30 to 50	College
0 to 30	College graduate

Conclusion

The readability analysis of the dairy mobile app will help us to get a first-hand knowledge on the effectiveness and user-friendliness of the dairy mobile app. ICT applications in dairy in the form of these mobile applications is supposed to bring about revolutionary changes in this field in terms of easy and quick information dissemination, creating awareness and knowledge and finally better and sustainable livelihood. While launching any dairy app in developing countries should strive for an easier level of reading difficulty and change in the presentation format. Hence, the intentions with which mobile apps were launched in dairy will be fulfilled directly or indirectly if we take into consideration the readability of the apps along with focussing on user's reading level.

References

1. Benjamin R.G. (2012) Reconstructing readability: recent developments and recommendations in the analysis of text difficulty. *Educational Psychology Review,* 24:63–88.
2. Bruce B. and Rubin, A., Starr, K. (1981). Why readability formulas fail. *IEEE Transactions on Professional Communication,* 24:50–52.
3. Bahadori, S., Wainwright, W.T. and Ahmed, H.O. (2019). Readability of Information on Smartphone Apps for Total Hip Replacement and Total Knee Replacement Surgery Patients. *Journal of Patient Experience,* **7**(3): 395–98.
4. Chall, J.S. and Dale, E. (1995). Readability revisited: The New Dale-Chall readability formula. Brookline Books.
5. Flesch, R. (1948). A new readability yardstick. *Journal of Applied Psychology,* 32:221–233.
6. Knight, J. (2003). Scientific literacy: Clear as mud *Nature,* 423:376–378.
7. Gangil D.,Verma H.K., Singh, J., and Kashyap, N. 2019. Prioritisation of Information Demand of Dairy Farmers of Punjab. *International Journal of Current Microbiology and Applied Science,* 8(1): 2204-2212
8. Zamanian, M. and Heydari P. (2012). Readability of texts: state of the art. *Theory and Practice in Language Studies,* 2:43–53.


Dairy Management App
Breed Suitable for commercial dairy farming
Cattle breeds
Buffalo Breeds
Exotic Breeds
Crossbred breeds
Reproductive problems and its solution
Artificial insemination
Housing management
Selection of sites
Types of housing
House specifications
Cleaning and disinfection
Feeding
Type of feed ingredients
Dry matter requirement
Feeding schedule
Tips for feeding
Fodder preservation
Calf Management
Health care
Feeding
Housing
Climate stress management
General management
Good health
Care and management
Ameliorative measures
De worming schedule measures
Vaccination schedule
Clean Milk
Clean milk
Importance of clean
Steps in clean milk
Animal identification
Types of identification
Good health
Vices in dairy animals
Bar biting
Tongue rolling
Eye rolling