International Academy Journal of Agribusiness & Agricultural Science Annals
Volume 8, Issue 7, PP 20-45, ISSN: 2382-9025, November, 2023
DOI: 2721-449-0-7295-54-872
Double Blind Peer Reviewed International Research Journal
arcnjournals@gmail.com
https://arcnjournals.org

Entrepreneurship Training Module in Livestock Feed Processing for Lecturers in Colleges of Agriculture in North Central Nigeria

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***Abstract**: This study was carried out to investigate and package entrepreneurship training module in livestock feed processing for capacity building of lecturers of Colleges of Agriculture in North Central Nigeria. The study was guided by statement of five research objectives and five related research questions. Also, five corresponding null hypotheses were formulated and tested at 0.05 level of significance. The study adopted a Survey Research Design with a population of 1,313 made up of three groups: Lecturers of Colleges of Agriculture, Agricultural Extension Agents and Livestock Feed Entrepreneurs. The sample size for the study was 308 respondents estimated by Multistage Sampling Procedure. 69 item structured questionnaire for the study titled: Questionnaire for Entrepreneur Training Module in Livestock Feeds' Processing (QETMILFP) was designed by the researcher from the available literature with the help of experts through validation. The coefficient of reliability for the instrument was .92 determined by Cronbach Alpha Reliability Method. The research questions were answered using means and standard deviation while Analysis of Variance (ANOVA) was used in testing the hypotheses. The study discovered 5 relevant objectives, 10 suitable content, 12 instructional methods, 24 instructional materials and 14 evaluation techniques from the findings. Thus, the study recommended adherence to activities that could lead to the achievement of the relevant objectives of the module, re-training programmes for updating lecturers towards mastery of content of the module and evaluation of entrepreneurship competence based on practical performance of the trainee learning outcome rather than paper and pen conventional technique among other recommendations.*

***Keywords:** Livestock Feed Processing; Entrepreneurship Training; Module for Lecturers*

1.0 INTRODUCTION

1.1 Background to the Study

Feed is food for animal especially livestock. Feed for livestock could in turn provide food for man and a pathway to socio-economic sustenance of human life. The feed scarcity experienced in North Central Nigeria with multi-dimensional causes in the milieu of abundant feed productive resources is devastating. The people are ignorant, incompetent, structurally unemployed, engages in crises and are economically poor which required entrepreneurship intervention.

Identification and packaging of entrepreneurship training modules in livestock feed processing for capacity building of lecturers is sacrosanct to quit the effects of the devastation of feed scarcity and to achieve the desired socio-economic liberty in North Central Nigeria. In a statement Holden (2021), described materials referred to as feed as made of single or multiple substances, such materials are either raw, semi-processed or fully processed which must be edible, digestible, absorbed and used by the bodies of food producing animals known as livestock. Studies by Herdge (2018), revealed that livestock are farm animals that are raised either for food, sale or pleasure, the term livestock as used does not include poultry or farmed fish; however, the inclusion of these within the meaning of livestock is common. Livestock could produce labor and commodities such as meat, milk, fur, leather and wool. In the context of this study the term livestock is used to represent conventionally farmed animals that despite their importance constitutes crises to the public regarding their nature of feeding. Such livestock in North Central Nigeria include cattle, sheep, goat and pig others are horses, asses and mules among others. Livestock feed could, hence, connotatively refer to any edible material that is either naturally grown, purposively produced, processed or may be distributed by marketing to supply the nutritional requirement of domestic animal.

The two basic types of livestock feeds are fodder and forage (Shield, 2017). Fodder crops are crops cultivated primarily for animal feed, including natural grasslands and cultivated pastures. Fodder could also refer to plants cut and carried to animals in bunches, rather than that food which they forage for themselves. Fodder could further be referred to as processed or conserved forages. Fodder includes hay, straw, silage, compressed and pellet feeds, oils and mixed rations, and sprouted grains and legumes. Fodder products include among others sorghum, pearl millet, maize, cowpeas and guar. On the other hand, forage could be referred to as the edible parts of plants, grown for feeding animals other than separated grain, which can be harvested for feeding (Allen, Batello, and Hodgson, 2011). Livestock feed is further classified as roughages, concentrates, supplements and additives (Saleh, 2016; Shrivastava and Swarup, 2014). Salman, El-Shargi, Al-Habsi and Al-Sadairi (2017) pointed that the main factors limiting ruminants' productivity is the shortage of feed resources resulting from the declining natural pasture; the major source of feeds in the traditional feeding system. Shortage of feed could have negative effects on livestock productivity and performance; low birth and growth, loss in milk, meat and fur as well as high sustainability of flock to diseases and death. The traditional feeding practice can no longer sustain livestock production, for instance, the free-range grazing system known as open grazing has been facing prohibition in most parts of Nigeria due to associated crises, and can no longer sustain livestock production (Tanko, 2021).

Feed processing usually means altering the physical and chemical nature of feed commodities to optimize utilization by animals and to enhance mixing and stability of the diet (Van Zanten, 2016). The importance of livestock feed processing cannot be overemphasized, the target is to: increase shelf-life of feed stuff, increase profitability of feed products, increase mechanization, increase digestibility of feeds and to convert agricultural waste products to feed wealth (Bentoli.com, 2021 and Van Zanten, 2016). Livestock feed processing improves palatability, lowers transportation and storage costs and has the advantage of changing from environmental nuisance to environmental opportunity. Roughages and grains are the feeds components most likely

processed. Institute for Feed Education and Research IFEEDER (2021), revealed the four basic steps in making animal feed as enumerated; feed millers receive raw ingredients from suppliers upon arrival, the ingredients are weighed, tested and analyzed for various nutrients to ensure their quality and safety. Then, through a complex process, nutritionists create a formula for nutritionally sound and balanced diets for the livestock. Once the formula is determined, the mill mixes the ingredients to create a finished product. The feed is finally packaged and labelled. Despite justification of feed processing to humanity, observations have shown that the adoption of livestock feed processing in North Central Nigeria is not satisfactory, the people are ignorant, incompetent, structurally unemployed and socio-economically poor in living standard. Ukonze, Odo and Ogu (2017), asserted that to overcome socio-economic crises, people should engage themselves in entrepreneurship.

Entrepreneurship as described by Uzuagulu and Uzuagulu (2013), is taking a bold heart and hand to enter a business, bear the business risk until progress and profits are achieved. Mohammed (2018), convinced that an entrepreneur is a person while entrepreneurship is the process; entrepreneurship is a process under taken by an entrepreneur to create incremental value and wealth by discovering investment opportunities, organizing enterprises, undertaking risks and economic uncertainty and there by contributing to economic growth. As pointed the four key elements of entrepreneurs are; visioning opportunities, innovation of new business, risk bearing in facing uncertainty and organization of the necessary resources. Egbule (2018), generally viewed the objectives of entrepreneurship education to include: To offer functional education that will enable students to be self-employed and self-reliance; to apply creative and innovation that is move from idea to action in business activities; to help students acquire vocational skills and develop linkages with business, industry and the community; to think strategically, in initiating, planning and managing projects among others. In the context of this study, entrepreneurship is a training process involving the use of a guided document called module intended to produce entrepreneurs with bold heart and hands to venture in to a livestock feed processing business; bear the business risk until progress and profits are achieved. The Training module is, therefore, important as a propeller of entrepreneurial competence in livestock feed processing business establishment

Training in the view of Ekele (2019), is a process and usually involves a certified expert working with a trainee, in the course of training, the expert transfer skills to the learner to enable the trainee improve and master the job at hand. As it relates to this study, training could mean the use of a guided module by lecturers in colleges of agriculture in the process of imparting competence required by students to enable them gain expertise and confidence in livestock feed processing for self-employment and economic emancipation. In training, competencies are designated in form of modules as units of educational and training curriculum programme. A module as explained by Ekele (2019), is a unit or units of study which if combined make a complete course which may be thought at college or tertiary institution level. Wever (2015), noted that in a module objective, content and methodologies, including facilities and evaluation are presented and carried out in a concise form to ensure that both the trainer and the trainee participate effectively in the programme.

Training modules are designated towards achieving specific objectives hence, Akande and Alabi (2016), established that for a nation to achieve meaningful and sustainable economic development adequate attention must be given to wide spread of economic activities through entrepreneurship education in our tertiary institutions. Mani (2015) viewed that students are highly interested in starting their own business thus, require decision making skills, risk taking capacity, creativity, communication skills and ability to prepare business plan. It is therefore the responsibility of lecturers ensuring that appropriate instructional strategies are used in motivating students for satisfactory learning outcome towards attainment of the module objectives. Yakubu, Adeyemi, Oyeniyi, and Salawu (2021), pointed that simulation, case study, business plan creation, problem-solving and team working instruction strategies were among instruction strategies for effective teaching of entrepreneurship education. Kaizer (2018*),* lamented that secondary schools in Delta State required 20 instructional materials for the teaching of entrepreneurship in business studies for employment skills development but were not available, hence, it requires that teachers of agricultural science should improvise. Concerning evaluation techniques, Shirandula (2021), examined that there is evidence of a positive relationship between evaluation methods of Entrepreneurship Education and acquisition of entrepreneurial skills, the author continue that the use of end-term sit-in exams; participation in class by answering questions and, sit-in tests methods were found to be theoretical-based and examination-oriented and thus inadequate to evaluate a high level of entrepreneurial skills. A training Module in the context of this study is a guided course of study containing unit of instruction, packaged to offer learning experiences inform of occupational knowledge, good characters and productive skills, intended to direct, improve and ascertain the general competence of students in livestock feed processing through their lecturers for achieving socio-economic liberty in North Central Nigeria. It is an instructional material in which competency needs of course requirements is inscribed; an oracle of instructional information for the school, teachers and learner's as well as instructional medium through which productive resources in the livestock feed processing industry can be transformed from waste to wealth.

Sijibomi and Miller (2014) established that the course content of tertiary education curriculum in Nigeria, lacks practical entrepreneurial experience. With low level of entrepreneurial skill acquisition, these institutions cannot produce graduates to be self-employed and employers of labour. The Federal Government of Nigeria, in her National Policy on Education (2013) recognized agriculture as an entrepreneurial vocational discipline and with the mandate for the establishment of Colleges of Agriculture in Nigeria since 1970, it is believed that entrepreneurship Training in livestock feed processing is domiciled. The National Board for Technical Education (NBTE) regulates the Colleges of Agriculture including curriculum activities. The programme operates mono-technic for award of National Diploma ND and High National Diploma HND in a minimum of two and four academic years respectively. A full list of NBTE revealed that there are thirty-three (33) government owned Colleges of Agriculture in Nigeria. Out of these, ten (10) are located in North Central Nigeria, though, only seven (7); made up of three federal and four State Colleges of Agriculture are fully accredited and approved to offer Animal Production Technology and Animal Nutrition programmes under which entrepreneurship training in livestock feed processing could have a place to be offered. These seven Colleges of Agriculture include: Akperan Orshi College of Agriculture (about switching to Akperan Orshi polytechnic) Yandev, Gboko, Benue

State; College of Agriculture DAC- ABU, Kabba, Kogi State; College of Agriculture Lafia, Nassarawa State; Federal College of Animal Health and Production Technology Vom, Plateau State; Plateau State College of Agriculture Garkawa; Niger State College of Agriculture Mokwa and Federal College of Wildlife Management New Bussa, Niger State.

In Colleges of Agriculture, lecturers are concerned with formal training, while Agricultural Extension Agents and Livestock Feed Entrepreneurs do complementary aspects of the training in a non-formal school setting during Student's Industrial Works Experience Scheme (SIWES). The purpose of improving competence among prospective students is to empower them, overcome socio-economic challenges upon completion of the training program. On the contrary, the real situation is different, a mirage, much pathetic, as it masquerades and contravenes the mandate hitherto. Thus, in recent times graduates of the Colleges of Agriculture from Animal Nutrition and Animal Production programmes are often seen roaming the streets in search of employment opportunities. This situation led the researcher to embark on Entrepreneurship Training Modules in Livestock Feed processing for Lecturers in Colleges of Agriculture in North Central Nigeria". This is an attempt to fill the gap supposedly caused by lack of entrepreneurship competence in livestock feed processing for lecturers in Colleges of Agriculture in North Central Nigeria.

1.2 Statement of the Problem

Feed is food for animal especially livestock. Feed for livestock in turn could provide food for man and socio-economic sustenance of human lives. Feed processing usually means altering the nature of feed material for proper utilization by livestock. Livestock. Feed processing can increase the shelf-life, digestibility, palatability and profitability of feed products as well as improve mechanization and can convert agricultural waste environment to a wealthy environment.

In promoting livestock feed processing, government had established Colleges of Agriculture with Lecturers employed and charged with the responsibilities of imparting the relevant competence in livestock feed processing to students for self-reliance upon graduation. On the contrary, graduates in animal health and production programmes in Colleges of Agriculture in North Central Nigeria are often seen roaming about in search for employment in areas other than in Livestock Feed Processing. This could be a curriculum problem. Observation has also shown that, there is slow integration of practical entrepreneurial education activities into the curricula of higher institutions in Nigeria to be self-employed and employers of labour. Thus, the graduates' students are rendered ignorant, incompetent, structurally unemployed, crises engulfed and consequently poor in living standard despite available economic opportunities in livestock feed processing. Hence, the researchers' drive to identify and package entrepreneurship training module required in livestock feed processing for capacity building of lecturers of Colleges of Agriculture in North Central Nigeria.

1.3 Objectives of the Study

The study specifically sought to identify:

1. relevant objectives required for entrepreneurship training module in livestock feed processing.

2. suitable contents required for entrepreneurship training modules in livestock feed processing.
3. instructional methods required for entrepreneurship training modules in livestock feed processing.
4. instructional materials required for entrepreneurship training modules in livestock feed processing.
5. evaluation techniques required for entrepreneurship training modules in livestock feed processing.

1.4 Research Questions

The following research questions were raised to guide the study.

1. What are the mean ratings of the responses of Lecturers in Colleges of Agriculture, Agricultural Extension Agents and Livestock Feed Entrepreneurs on relevant objectives required for entrepreneurship training modules in livestock feed processing?
2. What are the mean ratings of the responses of Lecturers in Colleges of Agriculture, Agricultural Extension Agents and Livestock Feed Entrepreneurs on suitable contents required for entrepreneurship training modules in livestock feed processing?
3. What are the mean ratings of the responses of Lecturers in Colleges of Agriculture, Agricultural Extension Agents and Livestock Feed Entrepreneurs on instructional methods required for entrepreneurship training modules in livestock feed processing?
4. What are the mean ratings of the responses of Lecturers in Colleges of Agriculture, Agricultural Extension Agents and Livestock Feed Entrepreneurs on instructional materials required for entrepreneurship training modules in livestock feed processing?
5. What are the mean ratings of the responses of Lecturers in Colleges of Agriculture, Agricultural Extension Agents and Livestock Feed Entrepreneurs on evaluation techniques required for entrepreneurship training modules in livestock feed processing?

1.5 Research Hypotheses

The following null hypotheses were formulated for the study and tested at .05 level of significance.

H_{O1}. There is no significant difference in the mean ratings of the responses of Lecturers in Colleges of Agriculture, Agricultural Extension Agents and Livestock Feed Entrepreneurs on the relevance of objectives required for entrepreneurship training modules in livestock feed processing.

H_{O2}. There is no significant difference in the mean ratings of the responses of Lecturers in Colleges of Agriculture, Agricultural Extension Agents and Livestock Feed Entrepreneurs on the suitability of contents required for entrepreneurship training modules in livestock feed processing.

H_{O3}. There is no significant difference in the mean ratings of the responses of Lecturers of Colleges of Agriculture, Agricultural Extension Agents and Livestock Feed Entrepreneurs on the

instructional methods required for entrepreneurship training modules in livestock feed processing.

H_{O4}. There is no significant difference in the mean ratings of the responses of Lecturers in Colleges of Agriculture, Agricultural Extension Agents and Livestock Feed Entrepreneurs on the instructional materials required for entrepreneurship training modules in livestock feed processing.

H_{O5}. There is no significant difference in the mean ratings of the responses of Lecturers in Colleges of Agriculture, Agricultural Extension Agents and Livestock Feed Entrepreneurs on the evaluation techniques required for entrepreneurship training modules in livestock feed processing.

2.0 METHODOLOGY

The study adopted a survey research design, carried out in North Central Nigeria which covers six States and Federal Capital Territory Abuja. The area has been experiencing animal pastoral crises due to scarcity of livestock feeds. The population for the study was one thousand three hundred and thirteen (1,313) subjects with a sample size estimate of three hundred and eight (308) respondents made-up of twenty-one (21) Lecturers of Colleges of Agriculture who are specialized in different areas of animal production, one hundred and seventy-nine (179) Agricultural Extension Agents and one hundred and eight (108) Livestock Feed Entrepreneurs. By Multi-stage sampling procedure, with the use of Taro-Yamen's formula, the sample size was proportionately determine thus, n= N/1+N (e) ^{2} Where n= sample size, N= population, E= trovied error (5%), 1= constant. 69-item structured questionnaire titled Questionnaire for Entrepreneurship Training Module in Livestock Feed Processing (QETMILFP) was used for the study. The questionnaire was developed by the researcher from available literature with the assistance of experts. The questionnaire was divided into two parts: Part I was meant to collect demographic information on the respondents and Part II consisted of sections A-E, with each of the sections provided with an adjusted Likert Rating Scale of four optioned response categories of Highly Required (HR) 4, Moderately Required (MR) 3, Not Required (NR) 2 and Highly Not Required (HNR) 1 to elicit information for data required in answering research question I-V.

The questionnaire "QETMILFP" was validated by five experts; one from Animal Nutrition Department, one from Animal Production Department, two from Measurement, Evaluation under department of Education Foundations and General Studies, and another one from Agricultural Education Department all of Joseph Sarwuan Tarka University Makurdi. Reliability of the questionnaire was established by trial-test on thirty (30) respondents in Taraba state North Eastern Nigeria, for the purpose of determining the internal consistency of the items. The respondents to the trial-test were not the real parts of the study sample but had the same characteristics of the population of the study. Data collected from trial-test were analyzed using Cronbach Alpha reliability method. A Cronbach Alpha Coefficient (α) of .92 was obtained representing a high internal consistency of the questionnaire items with indication that the instrument was reliable for the purpose of data collection for the study. Data collection was

carried out by the researcher with the help of seven (7) research assistants. A total of three hundred and eight (308) copies of the questionnaire were distributed and 307 copies were retrieved, as one got missed from one of the Livestock Feed Entrepreneurs. Questionnaires were distributed and retrieved at the place of work of the respondents on a spot, in any case where questionnaires were not possibly completed on the spot, a compromised time was spared. Mean and standard deviation were used for data analysis in providing answers to research questions. The decision rule for acceptance or rejection of an item based on the mean value was 2.50. by using real number limit value, any item with a mean value of between 3.50-4.00 was regarded as Highly Required (HR), while a mean of between 2.50-3.49 was regarded as Moderately Required (MR). Also mean values between 1.50-2.49 were regarded as Not Required (NR) and mean values between 1.00-1.49 were regarded as Highly Not Required (HNR). Analysis of Variance ANOVA was used for test of null hypotheses at 0.05% level of significance using Statistical Package for Science and Social Sciences (SPSS) 2021 version. The decision rule on ANOVA was that where the Sig. value is equal or greater than the alpha value of 0.05%, the null hypothesis is accepted otherwise rejected. The result of the analysis was used for final selection of items required for entrepreneurship training module in livestock feed processing for lecturers in Colleges of Agriculture in North Central Nigeria.

3.0 RESULTS AND DISCUSSION

This section presents results of data analysis for the purposes of answering research questions and test of hypotheses.

3.1 Research Questions and test of hypotheses

Research Questions 1

What are the mean ratings of the responses of Lecturers in Colleges of Agriculture, Agricultural Extension Agents and Livestock Feed Entrepreneurs on relevant objectives required for entrepreneurship training module in livestock feed processing?

Table 1. Mean Ratings and Standard Deviation of Respondents on the Relevant Objectives Required for Entrepreneurship Training Module in Livestock Feed Processing (N=307)

S/no	Item Description	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	SD_1	SD_2	SD_3	$\bar{X}_G$	SD_G	Decision
1	To increase shelf-life of feed stuff.	3.38	3.54	3.52	.97	.79	.80	3.48	.81	Required
2	To increase digestibility of feed	3.00	3.51	3.55	1.22	.92	.86	3.35	.93	Required
3	To increase palatability of feed	3.67	3.64	3.58	.80	.67	.71	3.63	.69	Required
4	To increase mechanization.	3.90	3.64	3.58	.44	.67	.74	3.70	.68	Required
5	To increase profitability of feed products	3.71	3.67	3.59	.46	.55	.55	3.65	.54	Required

Key: where N = Number of respondents; $\bar{X}_1$ = Mean response of Lecturers; $\bar{X}_2$ = Mean response of Agricultural Extension Agents; $\bar{X}_3$ = Mean response Livestock Feeds Entrepreneurs; SD_1 = Standard Deviation of Lecturers; SD_2 = Standard Deviation of Agricultural Extension Agents; SD_3= Standard Deviation of Livestock Feeds Entrepreneurs; $\bar{X}_G$ = Grand mean response; SD_G = Grand Standard Deviation

Result in Table 1 revealed 5 items with their grand mean values ranged from 3.52 to 3.65 which were all greater than the cutoff point of 2.50. This indicated that the respondents agreed that all the 5 items were required and therefore, identified as relevant objectives for entrepreneurship training module in livestock feed processing. The Table also showed Grand standard deviation values of .54 to .93 for the items which indicates that the respondents were not far from the mean and one another in their opinion in a range of different items.

Hypothesis 1

There is no significant difference in the mean ratings of the responses of Lecturers of Colleges of Agriculture, Agricultural Extension Agents and Livestock Feeds Entrepreneurs on relevant objectives required for entrepreneurship training module in livestock feeds Processing.

Table 2. ANOVA for Testing Difference in the Mean Rating of Respondents on Relevance of Objectives required for Entrepreneurship Training Module in Livestock Feed Processing

	Sum of Squares	Df	Mean Square	F	Sig.	Decision
Between Groups	.154	2	.077	.475	.62	Accepted
Within Groups	49.291	304	.162			
Total	49.445	306				

Key: Where Sig = significant value (P-value); Df = Degree of Freedom; F= Fisher value

The data in Table 2 showed the p-value of .62 compared to be greater than the alpha value of 0.05. This implies that there was no significant difference in the mean ratings of the responses of lecturers, agricultural extension agents and livestock feed entrepreneurs on the relevant objectives required for entrepreneurship training module in livestock feeds processing. Therefore, the null hypothesis of no significant difference was accepted.

Research question 2

What are the mean ratings of the responses of Lecturers in Colleges of Agriculture, Agricultural Extension Agents and Livestock Feed Entrepreneurs on suitability of contents required for entrepreneurship training module in livestock feed processing?

Table 3. Mean Ratings and Standard Deviation of Respondents on Suitability of Contents required for Entrepreneurship Training Module in Livestock Feed Processing (N=307)

S/N	Item Description	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	SD1	SD2	SD3	X_G	SD_G	Decision
1	Definition of livestock feed processing and reasons for livestock feed processing	3.19	3.19	3.20	.75	.84	.72	3.19	.79	Required
2	Four basic steps in making animal feed	3.52	3.74	3.65	.51	.44	.50	3.63	.47	Required
3	Sources of nutrients for livestock feeds processing	3.14	3.16	3.17	.85	.89	.83	3.15	.86	Required
4	Importance of livestock feeds processing	3.86	3.64	3.63	.48	.64	.58	3.71	.61	Required
5	Classify livestock feed stuffs	3.29	3.36	3.29	1.01	.97	.96	3.31	.97	Required
6	General methods of processing	3.24	3.31	3.60	1.04	1.16	.85	3.38	1.06	Required
7	Good characteristics and traits of entrepreneurs in livestock feed processing.	2.95	3.39	3.30	.97	.86	.87	3.21	.87	Required
8	Planning for livestock feed processing	3.76	3.74	3.71	.44	.51	.58	3.73	.53	Required
9	Hay Processing	3.19	3.20	3.32	.81	.82	.73	3.23	.79	Required
10	Silage Processing	3.38	3.54	3.39	.60	.72	.84	3.43	.67	Required

Result in Table 3 revealed 10 items with their Grand Mean values ranged from 3.19 to 3.73 which were all greater than the cutoff point of 2.50. This indicated that the respondents agreed that all the 10 items were required and therefore, identified as suitable contents for entrepreneurship training module in livestock feed processing. The Table also showed standard deviation values of the items ranged from .47 to 1.06 which indicates heterogeneous responses from the mean in a range of different items.

Hypothesis 2

There is no significant difference in the mean ratings of the responses of Lecturers, Agricultural Extension Agents and Livestock Feed Entrepreneurs on suitability of content required for entrepreneurship training module in livestock feeds processing.

Table 4. ANOVA for Testing Difference in the Mean Rating of Respondents on Suitability of Content required for Entrepreneurship Training Module in Livestock Feed Processing

	Sum of Squares	Df	Mean Square	F	Sig.	Decision
Between Groups	.278	2	.139	4.006	.02	Rejected
Within Groups	10.556	304	.035			
Total	10.834	306				

The data in Table 4 showed the p-value of .02 compared to be less than the alpha value of 0.05. This implies that there was a significant difference in the mean ratings of the responses of lecturers, agricultural extension agents and livestock feed entrepreneurs on the suitability of content required for entrepreneurship training module in livestock feeds processing. Therefore, the null hypothesis of no significant difference was rejected.

Research Question 3

What are the mean ratings of the responses of Lecturers in Colleges of Agriculture, Agricultural Extension Agents and Livestock Feed Entrepreneurs on the instructional methods required for entrepreneurship training module in livestock feed processing?

Table 5. Mean Ratings and Standard Deviation of Respondents on Instructional Methods required for Entrepreneurship Training Module in Livestock Feed Processing (N=307)

S/No	Item Description	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	SD_1	SD_2	SD_3	$\bar{X}_G$	SD_G	Decision
1.	Questioning method	3.61	3.64	3.28	.97	.89	1.16	3.51	1.01	Required
2.	Discussion method	3.33	3.63	3.42	1.15	.80	.96	3.46	.89	Required
3.	Lecture method	3.14	3.69	3.50	1.28	.78	.96	3.44	.89	Required
4.	Brain storming method	3.19	3.55	3.12	1.33	.96	1.23	3.28	1.10	Required
5.	Demonstration method	3.71	3.59	3.43	.64	.81	.85	3.57	.82	Required
6.	Laboratory method	3.95	3.64	3.64	.22	.61	.53	3.74	.82	Required
7.	Field trip method	3.67	3.26	3.18	.58	.86	1.00	3.37	.57	Required
8.	Project method	3.57	3.59	3.41	.98	.65	.80	3.52	.90	Required
9.	Problem solving method	3.62	3.73	3.47	.50	.51	.69	3.60	.73	Required
10.	Collaborative method	3.62	3.72	3.68	.50	.45	.47	3.67	.59	Required
11.	Concept mapping	3.48	3.62	3.43	.98	.77	.93	3.51	.46	Required
12.	Guided discovery method	3.73	3.69	3.49	.43	.63	.73	3.63	.66	Required

Result in Table 5 revealed 12 items with their Grand Mean values ranged from 3.26 to 3.70 on a four-point rating scale which were all greater than the cutoff point of 2.50. This indicated that the respondents agreed that all the items were required and thus, identified as instructional methods

for entrepreneurship training module in livestock feed processing. The Table also showed standard deviation values of the items ranged from .46 to 1.10 which indicates heterogeneous responses from the mean in a range of different items.

Hypothesis 3

There is no significant difference in the mean ratings of the responses of Lecturers, Agricultural Extension Agents and Livestock Feed Entrepreneurs on instructional methods required for entrepreneurship training module in livestock feed processing.

Table 6. ANOVA for Testing Difference in the Mean Rating of Respondents on Instructional Methods required for Entrepreneurship Training Module in Livestock Feed Processing.

	Sum of Squares	Df	Mean Square	F	Sig.	Decision
Between Groups	2.455	2	1.228	8.528	.00	Rejected
Within Groups	43.758	304	.144			
Total	46.213	306				

The data in Table 6 showed the p-value of .00 compared to be less than the alpha value of 0.05. This implies that there was a significant difference in the mean ratings of the responses of lecturers, agricultural extension agents and livestock feeds entrepreneurs on instructional methods required for entrepreneurship training module in livestock feeds processing. Therefore, the null hypothesis of no significant difference was rejected.

Research Question 4

What are the mean ratings of the responses of Lecturers in Colleges of Agriculture, Agricultural Extension Agents and Livestock Feed Entrepreneurs on the instructional materials required for entrepreneurship training module in livestock feed processing?

Table 7. Mean Ratings and Standard Deviation of Respondents on Instructional Materials required for Entrepreneurship Training Module in Livestock Feed Processing (N=307)

S/No	Item	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	SD_1	SD_2	SD_3	$\bar{X}_G$	SD_G	Decision
1.	Chalk and chalk board	3.48	3.74	3.55	1.12	.67	.78	3.59	.75	Required
2.	White board and marker	3.62	3.53	3.42	.50	.72	.89	3.52	.77	Required
3.	Bulletin board	3.86	3.54	3.58	.48	.74	.79	3.66	.75	Required
4.	Trainers' guide	3.71	3.58	3.56	.46	.68	.82	3.61	.72	Required
5.	Books and journals	3.43	3.55	3.56	.93	.62	.69	3.51	.67	Required
6.	Charts and diagrams	3.38	3.51	3.62	.67	.54	.56	3.50	.56	Required

7.	Pictures, photograph and posters	3.67	3.43	3.62	.66	.81	.62	3.57	.75	Required
8.	Cinemas and films	3.61	3.69	3.62	.67	.51	.56	3.64	.54	Required
9.	Audio tapes	3.76	3.82	3.79	.62	.44	.49	3.79	.47	Required
10.	Television sets	2.90	3.65	3.54	1.18	.71	.84	3.69	.81	Required
11.	Computers	3.14	3.62	3.57	.85	.61.	.69	3.44	.67	Required
12.	Cameras	2.76	3.37	3.40	1.22	.88	.85	3.51	.91	Required
13.	Laboratories	3.57	3.46	3.70	.87	.68	.55	3.57	.66	Required
14.	Demonstration plot	3.43	3.47	3.55	.93	.81	.81	3.48	.81	Required
15.	Shovel	3.52	3.62	3.58	.87	.73	.74	3.57	.74	Required
16.	Cutlass	3.19	3.51	3.67	1.03	.84	.70	3.45	.81	Required
17.	Knives	2.62	3.06	3.37	1.07	.92	.83	3.01	.92	Required
18.	Sickles	3.33	3..55	3.53	1.15	.86	.78	3.47	.85	Required
19.	Polythene sheets	3.19	3.80	3.70	1.29	.65	.82	3.56	.78	Required
20.	Wheelbarrow	3.38	3.54	3.64	.86	.96	.75	3.52	.88	Required
21.	Water sources (bore holes and reservoir)	3.52	3.68	3.58	.87	.65	.87	3.59	.75	Required
22.	Water buckets and drums	3.81	3.51	3.36	.40	.94	1.04	3.56	.96	Required
23.	Processing machines	3.38	3.50	3.56	1.20	.88	.83	3.48	.88	Required
24.	Weighing machines	3.71	3.39	3.26	.56	1.12	1.11	3.45	1.09	Required
25.	Cold room	3.67	3.66	3.58	.58	.59	.62	3.63	.60	Required
26.	Wale house	3.90	3.36	3.29	.30	1.11	1.13	3.51	1.09	Required
27.	Bags	3.67	3.51	3.27	.80	1.04	1.18	3.48	1.08	Required
28.	Hand gloves	3.71	3.43	3.02	.72	1.05	1.26	3.38	1.13	Required

Result in Table 7 revealed 28 items with their Grand Mean values ranged from 3.13 to 3.84 which were all greater than the cutoff point of 2.50. This indicated that the respondents agreed that all the items were required and thus, identified as instructional materials for entrepreneurship training module in livestock feed processing. The Table also showed grand standard deviation values of the items ranged from .41 to 1.13 which indicates heterogeneous responses from the mean in a range of different items.

Hypothesis 4

There is no significant difference in the mean ratings of the responses of Lecturers, Agricultural Extension Agents and Livestock Feed Entrepreneurs on instructional materials required for entrepreneurship training module in livestock feeds processing.

Table 8. ANOVA for Testing Difference in the Mean Rating of Respondents on Instructional Materials required for Entrepreneurship Training Module in Livestock Feed Industry

	Sum of Squares	Df	Mean Square	F	Sig.	Decision
Between Groups	.146	2	.073	1.553	.22	Accepted
Within Groups	14.365	303	.047			
Total	14.511	305				

The data in Table 8 showed the p-value of .22 compared to be greater than the alpha value of 0.05. This implies that there was no significant difference in the mean ratings of the responses of lecturers, agricultural extension agents and livestock feeds entrepreneurs on instructional materials required for entrepreneurship training module in livestock feeds processing. Therefore, the null hypothesis of no significant difference was accepted.

Research Question 5

What are the mean ratings of the responses of Lecturers in Colleges of Agriculture, Agricultural Extension Agents and Livestock Feed Entrepreneurs on the evaluation techniques required for entrepreneurship training module in livestock feed processing?

Table 9. Mean Ratings and Standard Deviation of Respondents on Evaluation Techniques required for Entrepreneurship Training Module in Livestock Feed Processing (N=307)

S/No	Item Description	$\bar{X}_1$	$\bar{X}_2$	$\bar{X}_3$	SD_1	SD_2	SD_3	$\bar{X}_G$	SD_G	Decision
1.	Observation	3.62	3.53	3.35	.50	.50	.50	3.50	.50	Required
2.	Questioning	3.86	3.62	3.61	.48	.74	.79	3.69	.74	Required
3.	Discussion	3.00	3.55	3.07	.00	.95	1.23	3.20	1.07	Required
4.	Assignment	3.57	3.79	3.38	.68	.50	.88	3.58	.69	Required
5.	Test	3.90	3.68	3.36	.30	.68	.96	3.64	.79	Required
6.	Examination	3.62	3.53	3.43	.50	.76	.79	3.52	.76	Required
7.	Interview	3.86	3.63	3.36	.36	.76	.99	3.61	.84	Required
8.	Expert review	3.86	3.71	3.53	.36	.56	.70	3.70	.61	Required
9.	Survey	3.86	3.75	3.64	.36	.47	.69	3.75	.55	Required
10.	Follow-up visit	3.95	3.63	3.63	.22	.70	.61	3.73	.65	Required
11.	Dairy	3.76	3.66	3.47	.77	.75	.88	3.63	.80	Required
12.	Logbook	3.81	3.81	3.71	.60	.47	.63	3.77	.54	Required

13.	Practical	3.76	3.53	3.57	.70	.66	.72	3.62	.68	Required
14.	Project	3.81	3.59	3.61	.68	.62	.59	3.67	.61	Required

Result in Table 9 revealed 14 items with their mean values ranged from 3.41 to 3.78 which were all greater than the cutoff point of 2.50. This indicated that the respondents agreed that all the items were required and therefore, identified as evaluation techniques for entrepreneurship training module in livestock feed processing. The Table also showed standard deviation values of the items ranged from .50 to 1.07 which indicates heterogeneous responses from the mean in a range of different items.

Hypothesis 5

There is no significant difference in the mean ratings of the responses of Lecturers, Agricultural Extension Agents and Livestock Feed Entrepreneurs on evaluation techniques required for entrepreneurship training module in livestock feed processing.

Table 10. ANOVA for Testing Difference in the Mean Rating of Respondents on Evaluation Techniques required for Entrepreneurship Training Module in Livestock Feed Processing

	Sum of Squares	Df	Mean Square	F	Sig.	Decision
Between Groups	3.039	2	1.520	16.17	.00	Rejected
Within Groups	28.593	304	.094			
Total	31.632	306				

The data in Table 10 showed the p-value of .00 compared to be less than the alpha value of 0.05. This implies that there was a significant difference in the mean ratings of the responses of lecturers, agricultural extension agents and livestock feeds entrepreneurs on evaluation technique required for entrepreneurship training module in livestock feeds processing. Therefore, the null hypothesis of no significant difference was rejected.

4.2 Discussion of Findings

Findings of the study identified 5 relevant objectives of livestock feed processing required for entrepreneurship training module in livestock feed processing. The identified objectives of livestock feed processing include: To increase shelf-life of feed stuff; to increase digestibility of feeds; to increase palatability of feeds; to increase mechanization and to increase profitability of feed product. These findings agreed with Egbule (2018), who viewed the objectives of entrepreneurship education to include: to offer functional education that will enable students to be self-employed and self-reliance; to train students to recognize, create and be able to act on business opportunities; to apply creative and innovation that is move from idea to action in business activities; to develop self-awareness, interpersonal and social network skills; to think strategically, in initiating, planning and managing projects and to help students acquire vocational skills and develop linkages with business, industry and the community. These findings also agreed with Akande and Alabi (2016), who established that for a nation to achieve meaningful and sustainable economic development adequate attention must be given to wide spread of

economic activities through entrepreneurship education in our tertiary institutions.

Findings of the study identified 10 suitable contents required for entrepreneurship training module in livestock feed processing. The identified suitable contents include: Definition of livestock feed processing and reasons for livestock feed processing; four basic steps in making animal feed; sources of nutrients for livestock feeds processing; importance of livestock feeds processing; classify livestock feed stuffs; general methods of processing; good characteristics and traits of entrepreneurs in livestock feed processing; planning for livestock feed processing; Hay Processing and Silage Processing. The finding above also agrees with Egbe (2017), who opined that skills identified to be used as skill training were personal/psycho-social skills, critical and creative thinking skills, decision making skills, resource mobilization and organizing skills, leadership and sales skills. Again, Mani (2015), agree with the outcome of the findings that students are highly interested in starting their own business thus, require decision making skills, risk taking capacity, creativity, communication skills and ability to prepare business plan are the most important skills for a successful entrepreneur.

Findings of the study identified 12 instructional methods as required for entrepreneurship training module in livestock feed processing. The identified instructional methods include: Questioning method; discussion method; lecture method; brain storming method; demonstration method; laboratory method and field trip method others are project method; problem solving method; collaborative method; concept mapping and guided discovery method. The above finding is in agreement with Yakubu, et al. (2021), who conducted a study to examine entrepreneurship education instruction strategies and graduates' self-reliance and agreed that simulation, case study, business plan creation, problem-solving and team working instruction strategies were among instruction strategies for teaching entrepreneurship education. Ukonze, et al. (2017), confirmed that there should be 8 methods of instruction, apart from 8 objectives, 9 content, 14 resources and 6 evaluation methods for performance assessment in entrepreneurial Centre for economic empowerment in Enugu State.

Findings of the study identified 28 instructional materials as required for entrepreneurship training module in livestock feed processing. The identified instructional materials include: Chalk and chalk board; white board and marker; bulletin board, training guides, books and journals; charts and diagrams; pictures, photographs and posters. Others are; cinemas and firms; audio tapes; television sets; computers; cameras; laboratories; demonstration plots; hoe; shovels, cutlass; knives; sickles; polythene sheet; wheelbarrows; water sources; water buckets; freezers; weighing machines; processing machines; cold room; wale house bags and hand gloves. These findings agreed with Kaizer (2018*)*, who revealed that 20 instructional materials required for the teaching of entrepreneurship in business studies for employment skills development but were not available in secondary schools in Delta State. Thus, it requires that teachers of agricultural science should improvise some of the instructional materials lacking in the school locally.

Findings of the study identified 14 evaluation techniques as required for entrepreneurship training module in livestock feed processing. The identified instructional evaluation techniques include: Observation; questioning; discussion; assignment; test; examinations; interview; expert review; survey; follow-up visit; dairy; logbook; practical and project. The finding agrees with

Shirandula (2021), who examined the relationship between evaluation methods of Entrepreneurship Education (EE) and acquisition of entrepreneurial skills among students. According to the researcher, there is evidence of a positive relationship between evaluation methods of EE and acquisition of entrepreneurial skills, the use of end-term sit-in exams; participation in class by answering questions and, sit-in tests methods were found to be theoretical-based and examination-oriented and thus inadequate to evaluate a high level of entrepreneurial skills. Evaluation based on appraisal of practical performance such as techniques identified by this study will go a long way improving entrepreneurship training at the colleges of agriculture in livestock feed industry in North Central Nigeria.

4.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

4.1 Summary

There was a concern for investigation into entrepreneurship training module in livestock feed processing for Lecturers in Colleges of Agriculture in North Central Nigeria. Five research objectives, five relevant questions and five corresponding hypotheses guided the investigation with a survey research design in the area of North Central Nigeria. The study population was 1,313 subjects, using multi-stage sampling procedure, a sample size of 308 was estimate. A structured questionnaire for Entrepreneurship Training Module in Livestock Feed Processing (QETMILFP) dully validated by five (5) experts with a Cronbach alpha reliability coefficient of. 92 was used as instrument for the study. Means and standard deviation were used to answer research questions while ANOVA was used for test of hypotheses. Findings of the study identified; relevant objectives, suitable contents. Instructional methods, instructional materials and evaluation techniques required for entrepreneurship training module in livestock feed processing for lecturers of Colleges of Agriculture in North Central Nigeria.

4.2 Conclusion

Based on the findings of the investigation, Entrepreneurship Training Module in Livestock Feed Processing for Lecturers of Colleges of Agriculture in North Central Nigeria has been identified and packaged. It is hoped that the package module will benefit Lecturers as a guide in selection of objectives, mastery of content, selection of instructional methods and materials as well as adoption of appropriate evaluation techniques while training on livestock feed processing.

4.3 Recommendations

Based on the findings of this study the following recommendations were made:

1. Acceptance and funding of the module by the relevant curriculum stake holders for monumental implementation.
2. Adherence to activities that could lead to the attainment of the relevant objectives of the module by lecturers.
3. Organized re-training programmes in form of workshops, seminars, and conferences by the stake holders for updating lecturers towards mastery of content for the improvement of entrepreneurship education and training at the College of Agriculture level.

4. Adoption and combination of more practical oriented methods of instructions by Lecturers, since no one method is best to establish the foreseen positive relationship between methods of instruction and acquisition of practical entrepreneurship competence.
5. Adequate procurement of the identified instructional materials to be ensured by management of the Colleges of Agriculture while lecturers to strictly improvise where lacking.
6. Evaluation should remain an integral part of entrepreneurship training in livestock feed processing and evaluation of entrepreneurship competence should be based on practical performance of the trainee learning outcome rather than paper and pen conventional technique which are based on participation in class answering questions, sit-in-test and end-term sit-in-exams methods.

4.4 Contribution to Knowledge

1. By packaging, the study identified, relevant entrepreneurship competences required for harnessing opportunities in livestock feed processing for professional capacity building of Lecturers which for long seem to have been undermined.
2. The result of the study provided relevant objectives and suitable content required to guide and be mastered by Lecturers that could lead to profitable entrepreneurship training in livestock feed processing.
3. More so, the study identified instructional methods and materials required by lecturers of Colleges of Agriculture during entrepreneurship training in livestock feed in livestock feed processing.
4. The study finally, identified evaluation techniques required by lecturers in colleges of agriculture for entrepreneurship training in livestock feed processing.

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ENTREPRENEURSHIP TRAINING MODULE REQUIRED BY LECTURERS ON PROCESSING IN LIVESTOCK FEED INDUSTRY.

TOPIC	PERFORMANCE OBJECTIVE	CONTENT	METHOD		INSTRUCTIONAL MATERIAL	EVALUATION GUIDE
			TEACHER ACTIVITIES	STUDENT ACTIVITIES		
A	B	C	D	E	F	G
Livestock Feed Processing: Definition, Reasons	Define feed processing and give reasons for livestock feed processing.	Definition of livestock feed processing and reasons for livestock feed processing.	Lead students define feed processing and give reasons for livestock feed processing.	Participate, listen and write notes as the lecturer correctly define and give reasons for livestock feed processing	Different Brands of Feedstuffs	Define livestock feed processing and give reasons for livestock feed processing.
Steps and Sources of Nutrients in Making Animal Feed	State the four basic steps in making animal feed	Four basic steps in making animal feed	Lead students to discover and state the four basic steps on making animal feed.	Take notes on the four basic steps on making animal feed	Diagram showing; -Raw Materials for Feed Processing -Facilities for feed processing eg driers, grander, mixer and sacks.	State the four basic steps on making animal feed

TOPIC	PERFORMANCE OBJECTIVE	CONTENT	METHOD		INSTRUCTIONAL MATERIAL	EVALUATION GUIDE
			TRAINER'S ACTIVITIES	TRAINEE'S ACTIVITIES		
A	B	C	D	E	F	G
	State sources of nutrients for livestock feeds processing	Sources of nutrients for livestock feeds processing	Guide students -discussion on sources of nutrients for livestock feeds processing. Lead students' in Formulation of different feeds stuff	Listen, participate and take written notes	Diagram showing Different Sources of Feed Eg; grasses, rice bran, fruits peels, soybeans cassava, etc	State sources of nutrients for livestock feeds processing
	State the importance of livestock feed processing	Importance of livestock feeds processing	Assist students discover and state the importance of livestock feed processing	Listen, think, participate and take written notes	A chart showing importance of livestock feed processing	What are the importance of livestock feed processing?
Classification of Livestock Feed stuffs	Classify livestock feeds stuffs	Classification of livestock feed stuffs	Demonstrate using different feed sources to classify livestock feeds stuffs into two and four groups	Involve in the demonstration practice and take written notes according to the various feed classes.	-Diagram Showing Classification of Livestock Feeds. Eg carbohydrates, protein, fats, vitamins and minerals -Different Sources of Feeds Materials	Classify livestock Feed stuffs?

TOPIC	PERFORMANCE OBJECTIVE	CONTENT	METHOD		INSTRUCTIONAL MATERIAL	EVALUATION GUIDE
			TRAINER'S ACTIVITIES	TRAINEE'S ACTIVITIES		
A	B	C	D	E	F	G
Methods of Processing Livestock Feed	Discuss the various methods of processing livestock feed.	-General methods of processing in livestock feeds industry. -Specific methods of processing: hay, silage and others	Lead students on -theoretical discussion -Practical Laboratory studies - Visit to livestock feed factory	Participate fully on every strategy used in studying various methods of processing livestock feed.	Diagrams showing; -Raw Materials required for Feed Processing -Facilities required for feed processing eg; CaOH, NaOH, Cutters, Driers, Grander, Mixer, basins, water, Sacks etc.	Discuss the various methods of processing livestock feed

TOPIC	PERFORMANCE OBJECTIVE	CONTENT	METHOD		INSTRUCTIONAL MATERIAL	EVALUATION GUIDE
			TRAINER'S ACTIVITIES	TRAINEE'S ACTIVITIES		
A	B	C	D	E	F	G
Characteristics and Traits of Entrepreneurs in Livestock Feed Processing Enterprise	State characteristics and traits of entrepreneurs in livestock feed processing enterprise	Characteristics and traits of entrepreneurs in livestock feed processing enterprise	-Impart good characters and encourage good trait among students. -Point out relevant characters and traits required of a successful entrepreneur to include innovativeness/ creativeness, task acceptance, risk taker, loyalty/trustfulness, intelligent etc.	-Submissive and listen to the Lecturer -Take important notes		Identify characteristics and traits of entrepreneurs in livestock feed processing enterprise

TOPIC	PERFORMANCE OBJECTIVE	CONTENT	METHOD		INSTRUCTIONAL MATERIAL	EVALUATION GUIDE
			TRAINER'S ACTIVITIES	TRAINEE'S ACTIVITIES		
A	B	C	D	E	F	G
Livestock Feed Processing	Plan for livestock feed processing	Planning for livestock feed processing	Acquit students about planning concepts such as: resources, market, budget and records of financial transactions in livestock feed processing		-Weighing machine -sources of nutrient -grinding machine -basins Cutters -water source -Plastic sheet	State how you could plan profitably in a livestock feed processing bus.
	Process hay	Hay processing	The lecturer lead students in demonstration on hay making process	Student listen, watch and practically involved in demonstrations for hay making	As above	Discuss on how hay can practically be made

TOPIC	PERFORMANCE OBJECTIVE	CONTENT	METHOD		INSTRUCTIONAL MATERIAL	EVALUATION GUIDE
			TRAINER'S ACTIVITIES	TRAINEE'S ACTIVITIES		
A	B	C	D	E	F	G
	Process silage	Silage processing	The lecturer lead students in demonstration on silage making process	Student listen, watch and practically involved in demonstrations for silage making	As above	State the various stages involved in silage making

Activities Livestock Feed on Processing

1. Collect and identify different raw (nutritional) materials required in feed making.
2. Students should select different feedstuff (materials) then classify into (a) two as fodder and forage (b) four as: Roughages, concentrates, supplements and additives.
3. Students should practically study different methods of feed processing with regards to:
   Dry processing, wet processing, grinding and mixing.
4. Students should visit livestock feed factory with the emphasis on mastery of the skills required in silage and hay making procedure