

- a. Course Code: AGB:857
- b. Title: Animal Feed Technology
- c. Credit Hours: 3(3-0)
- d. Objectives
 - To introduce the animal Feed quality and adulteration in Pakistan
 - To introduce Animal Feed and its contents
 - To introduce animal feed technology business and strategies
- e. Outcomes

The student, at the end of the learning of this Unit:

 - Is able to characterize the different categories of feedstuff and their components.
 - Can determine the nutritional value of animal feedstuff and elaborate and use feed composition tables.
 - Has gained further insight into applied feed production technology and the economic implications of such production.
 - Is able to analyse the quality standards for feed and compound feed, and to use the methodology applied for standard assessment.
 - Knows how to apply methods to control feedstuff safety, measurement techniques and evaluation systems.
- f. Contents with suggested contact hours
 - Production Quality Assurance and Control Systems
 - Quality Requirement for feed.
 - Animal feed quality influences animal health and productivity (HACCP & GMP).
 - Good Manufacturing Practices.
 - Guidance, Testing, and Quality assurance in order to the production of high quality, safe and consistent products.
 - Hazard Analysis Critical Control Points (HACCP).
 - 1. Quality Management System
 - Quality Control and Quality Assurance: Auditing of Feed Production
 - 2. Feed Ingredient

- The nutritional, Technological, Sensory, Safety and Emotional qualities of Animal Feed.
 - Feed Assessment: Organoleptic, Chemical and Microbiological Assessments.
 - Analytical Assessment: Monitoring quality, contamination and diseases.
3. Feed Testing Methods.
- Microorganisms in Animal Feed.
 - Wet Chemistry and Instrumental Analytics.
 - Physical testing methods to characterize the feed.
4. Adulteration in Feed
- Vulnerability of the Animal Feed chain to Adulteration.
 - Types of Fraud: Adulteration, Tempering, Product Overrun, Theft, Diversion, Stimulation and Counterfeiting.
 - Surveillance and Mitigation Measures
5. Feed Types and composition
- Ensiling Process of Forages
 - Factors affecting the digestibility and metabolizable energy of feeds
 - Characteristic of microbe's organization in the rumen
- g. Details of lab work, and workshop practice (if applicable). **Not**
- Applicable**
- h. Recommended Reading (including Textbooks and Reference books with dates).
- Animal Nutrition and Feed Technology By Raman Rao. NEW INDIA PUBLISHING AGENCY- NIPA (July 5, 2019).
 - Animal Nutrition (8TH Edition) By **Peter McDonald, J.F.D. Greenhalgh, C A Morgan, R Edwards, Liam Sinclair**. Pearson Education; (March 1, 2022).

- Animal Nutrition: From Theory to Practice By Philip I. Hynd. CSIRO PUBLISHING (November 1, 2019) **Academic Publishers (August 2019).**

Academic Plan

Topic	Suggested contact hours
1. Production Quality Assurance and Control Systems <ul style="list-style-type: none"> • Quality Requirement for feed. • Animal feed quality influences animal health and productivity (HACCP & GMP). • Good Manufacturing Practices. • Guidance, Testing, and Quality assurance in order to the production of high quality, safe and consistent products. • Hazard Analysis Critical Control Points (HACCP) 	6
2. Quality Management System <ul style="list-style-type: none"> • Quality Control and Quality Assurance: Auditing of Feed Production 	6
3. Feed Ingredient <ul style="list-style-type: none"> • The nutritional, Technological, Sensory, Safety and Emotional qualities of Animal Feed. • Feed Quality Assessment: Organoleptic, Chemical and Microbiological Assessments. • Analytical Assessment: Monitoring quality, contamination, and diseases 	6
4. Feed Testing Methods. <ul style="list-style-type: none"> • Microorganisms in Animal Feed. • Wet Chemistry and Instrumental Analytics. • Physical testing methods to characterize the feed. 	6

<p>5. Adulteration in Feed</p> <ul style="list-style-type: none"> • Vulnerability of the Animal Feed chain to Adulteration. • Types of Fraud: Adulteration, Tempering, Product Overrun, Theft, Diversion, Stimulation and Counterfeiting. • Surveillance and Mitigation Measures 	<p>6</p>
<p>6. Feed Types and composition</p> <ul style="list-style-type: none"> • Ensiling Process of Forages • Factors affecting the digestibility and metabolizable energy of feeds • Characteristic of microbe's organization in the rumen 	<p>6</p>