

AN-201
Principles of Animal Nutrition

Introduction to the course

By Tanveer Ahmad



Animal Nutrition-201
Principles of Animal Nutrition
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Animal?

A multi-cellular organism

Plants vs Animals

Kingdom: Animalia

- ✓ Capacity for locomotion
- ✓ Non-photosynthetic metabolism
- ✓ Pronounced response to stimuli
- ✓ Restricted growth
- ✓ Fixed bodily structure

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What is Nutrition?



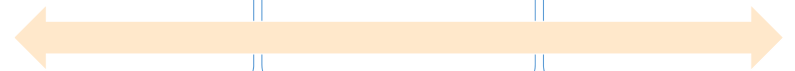
Taking in and
utilization of
food



Body's
handling of
nutrients

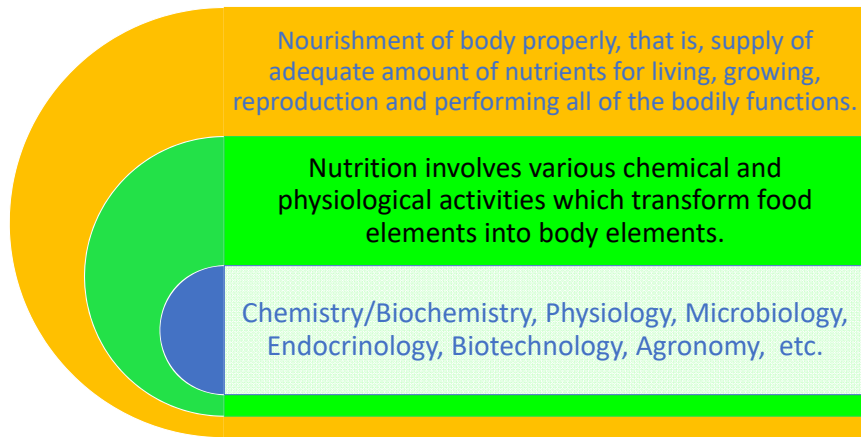


Integration of
many scientific
disciplines



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What is Nutrition?



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Lecture Topics

- Scope of AN
- History & Development of Sci. of Nutr.
 - Eras of development (8 Eras)
 - Naturalistic Era
 - Chemical-Energy Era
 - Mineral Era
 - Vitamin-Biological Era
 - Feeding Standard Era
 - Amino acid Era
 - Feed Additive and Implant Era
 - Biotechnology Era

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Nutritional Security

- In addition to sufficient calories:
 - a range of nutrients in the right proportion is needed to maintain health, with the optimum proportion varying during a lifetime and in different circumstances.

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What is Nutritional Security?

- It goes beyond advocating for appropriate quantities of food.
- It also addresses people's need for an appropriate combination of nutrients from their diet-combination that are required to sustain growth, health, healing and an active life for all people for at all stages of development.
- Health problems-and associated social and economic effects-can arise from both deficient and excessive consumption of nutrients

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What is Nutritional Security?

- **Three most prevalent micronutrient deficiencies in developing countries**

- Deficiency of Iron (Anemia) Iodine (brain damage and mental retardation) Vit. A (blindness), Vit D (Bones disorders)

- **Health problems-Effects on Children**

- **Stunting:** Low height for age
- **Underweight:** Low weight for age
- **Wasting:** Low weight for height
- **Obesity:** Excess body fat in relation to lean body mass (Risk factor includes cardiovascular diseases, high blood pressure and glucose levels, bone and joint problems and sleep apnoea)

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Lecture Topics

- Basic Animal Nutrition (AN) Terminology
- Comparative digestive anatomy and physiology of ruminants and non-ruminants.
- Pre-gastric and Post-gastric digestion and absorption of major nutrients.
- Rumen ecology.
- Regulation of feed intake in non-ruminants and ruminants.

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Lecture Topics

- **Nutrients**

- Classification
- Digestion
- Absorption
- Metabolism
 - Energy , Protein
- Deficiency & Toxicity

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Lecture Topics

- Classification and functions of nutrients.
- Importance of water in the animal bodies its sources, requirements and losses.
- Carbohydrates nutrition: Structure classification, digestion and metabolism. Volatile fatty acids (VFA): production, absorption and metabolism in ruminants.

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Lecture Topics

- Lipids: classification, structure, digestion and metabolism.
- Protein and amino acid: classification, structure digestion and metabolism.
- Introduction to mineral and vitamins in animal nutrition.

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Lab Topics

- Local feedstuffs
 - Identification
 - Classification
 - Nutritional characteristics
- Sampling techniques for feed ingredients and forages
- Processing of feed samples for analyses
- Proximate analysis of feed

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Lab Topics

- Feed ingredient / Nutrient project
 - Brief overview of individual feedstuffs used in rations/ feed nutrient
 - In-class presentations (5 minutes)

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Books Recommended

- Guoyao Wu. 2017. Principles of Animal Nutrition. Publisher Taylor & Francis Inc, Imprint by Productivity Press, Portland, United States
- McDonald, P., R.A. Edwards, J.F.D. Greenhalgh, C.A. Morgan, L. Sinclair and R. Wilkinson, 2011. Animal Nutrition. 7th ed. Benjamin Cummings, USA.
- Perry, T.W., A.E. Cullison and R.S. Lowery, 2008. Feeds and Feeding. 6th Edition. Prentice Hall, New Jersey, USA.
- Banerjee, G.C., 2005. Feeds and Principles of Animal Nutrition. Oxford, IBH Publishing Co., Pvt. Ltd. New Delhi, India.
- Sarwar, M. and Zia-ul-Hasan, 2000. Nutrient Metabolism in Ruminants. University of Agriculture Press, Faisalabad.
- A.O.A.C., 2000. Official Methods of Analysis of the Association of Official Analytical Chemists. Vol2, 17th Edi. Arlington, VA. USA.

www.youtube.com/c/tanvirah

www.foodfeedinfo.com

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