

MAHARASHTRA ANIMAL & FISHERY SCIENCES UNIVERSITY, NAGPUR
Annual Theory Examination of B. V. Sc. & A. H. Degree Course

Year : I (New Course)
Course No. : ANN-111, 121
Credits : 2+1 = 3, 2+1 = 3
Day & Date : Friday, 09/07/2010

Paper Title : Animal Nutrition - (I)
Total Marks : 30+30 = 60
Time : 10.00 to 13.00 hrs.

Note: 1) Use Separate Answer Book for each course.

- 2) Solve Any Three Questions from Section - 'A' of each course.
3) All Questions from Section - 'B' of each course are compulsory.
4) Draw neat & well labeled diagram wherever necessary.

ANN-111

(Principles of Animal Nutrition and Feed Technology)

Section - 'A'

- Q.1 A) Discuss various anti-nutritional factors present in feeds and fodder. (02)
B) Discuss Carbon-Nitrogen balance studies. (02)
- Q.2 A) Describe the functions of water in animal body. (02)
B) Discuss the classification of feeds and fodder. (02)
- Q.3 A) Enlist various methods of improving poor quality roughages and discuss urea treatment of paddy straw. (02)
B) Enlist various measures of evaluating protein quality and discuss in brief about biological value. (02)
- Q.4 Discuss soil, plant, animal and human relationship. (04)
- Q.5 Discuss the partitioning of food energy in ruminants. (04)

Section 'B'

- Q.6 Rewrite the statements after making the necessary corrections, if required. (06)
- a) Vitamins are inorganic in nature F
b) The digestibility of protein of tree leaves is higher than that of leguminous forages. F
c) Sweet clover disease is related with Vit. E deficiency.
d) Urea contains 46% protein.
e) Fat yields 2.41 times more energy than protein and carbohydrates.
f) Zinc deficiency in pigs causes anemia. F
g) Molasses is a by-product of starch industry. F
h) ME refers to the energy actually available for growth and maintenance. F
i) Processing of roughages does not increase their palatability and intake. F
j) Leguminous straw is inferior to cereal straw. F
k) Green Lucerne contains a toxic principle Trypsin inhibitor.
l) The pH of good silage should be 2.8-3.2. F
- Q.7 Give two examples of each. (06)
- 1) Leguminous fodder
2) Unconventional protein sources
3) Sources of Calcium
4) Non nutrient additives
5) Crops suitable for ensiling
6) Essential fatty acids
7) Feed supplements
8) Sulphur containing Vitamins
9) Non leguminous grasses
10) Animal origin protein sources
11) Tree leaves used as fodder
12) Maintenance type roughages

Q.8 A) Choose the most appropriate answer. (03)

- 1) Which part of cow's stomach resembles the true stomach of non-ruminants?
a) Rumen
b) Reticulum
c) Omasum
d) Abomasum
- 2) Average nitrogen content of protein is
a) 15.5%
b) 16%
- 3) Gastric juice is highly acidic and has a pH
a) 2.5-3.8
b) 4.0-4.4
- 4) Metabolic water produced per gram of fat is
a) 16.5%
b) 17%
c) 4.5-5.0
d) 5.0-5.5

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(30 Marks) ३०००

5) Net gain of ATP per mole of acetate is

- a) 10
- b) 18

d) None of above

6) Which of the following is the sulphur containing amino acid?

- a) Glycine
- b) Arginine
- c) Valine

d) Methionine

Q.8. B) Match the following

Group 'A'

- 1) Glycolysis
- 2) CTAB
- 3) Uric Acid
- 4) Animal Protein factor
- 5) Exudative diathesis
- 6) Dagnala disease

Group 'B'

- a) Vit. E
- b) Carbohydrate
- c) Selenium
- d) Van Soest
- e) NPN
- f) Vit. B₁₂

(3)

ANN-121

Applied Nutrition-I (Ruminants)

30 Marks

Section 'A'

Q.1 A) Describe different factors affecting utilization of NPN compounds in ruminants.
B) Discuss BMR.

(02)

Q2. Describe in brief:

(02)

- A) Factors affecting basal metabolism.
- B) Characteristic of balanced ration.

(02)

(02)

Q.3 A) Feeding of calf from birth to 3 months of age.
B) Feeding of pregnant and lactating does.

(02)

(02)

Q.4 Classify the different Feeding Standards and describe Indian Feeding Standards in detail.

(04)

Q.5 Enlist different methods of digestibility determination in farm animals and describe conventional method in detail along with its advantages and limitations.

(04)

Section - 'B'

Q.6 Give two examples of each.

(06)

- a) External Indicator for determining digestibility
- c) Productive Feeding Standards
- e) NPN sources

b) Statistical designs

d) Components of MFN

f) Internal indicator for determining digestibility

h) Essential Amino acids

j) Characteristic of balanced ration

g) Non-conventional protein sources

i) Non-conventional energy sources

k) Characteristic of Indicator used in digestibility studies

l) Components of adult growth

Q.7 Match the followings:

Group 'A'

- 1) SE ~ d
- 2) EUN ~ f
- 3) Thaer ~ e
- 4) Casein ~ a
- 5) Metabolic trial ~ b
- 6) Positive nitrogen balance ~ l
- 7) Atwater ~ k
- 8) NRC standards ~ v s a
- 9) ARC standards ~ v k
- 10) Nylon bag ~ h
- 11) BMR ~
- 12) Negative nitrogen balance ~ c

Group 'B'

- a) Purified diet
- b) Collection of urine and faeces
- c) Starvation
- d) Kellner
- e) Hay equivalent
- f) Metabolic body size
- g) USA
- h) Fistulated animal
- i) Body weight gain
- j) UK
- k) Physiological fuel value
- l) Post absorptive phase

(06)

Q.8 A) Give reasons for the following:

1. Flushing is advantageous in sheep.
2. Vit. A supplementation is essential during famine.
3. Pre-experimental period is essential in digestibility trials.
4. Higher plane of nutrition is beneficial to pregnant cows during last trimester.
5. *In-vitro* method of digestibility is important for forage breeders.
6. Purified diet is not suitable in large animal experimentation.

(03)

Q. 8 B) State **TRUE** or **FALSE**, rewrite the corrected statements.

(03)

- 1) BIS specification for maximum moisture content for storage of animal feeds is 15%.
- 2) MFN is directly related to protein intake of animal.
- 3) Fine grinding of roughages improves its digestibility.
- 4) Urea is used as source of energy in ruminants.
- 5) Colostrum is rich source of gamma globulin.
- 6) TDN value of some feeds may exceed 100.

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ANNUAL THEORY EXAMINATION, B.V.Sc. & A.H.

Year : I (New Course)
Course No. : ANN-111, 121
Credits : 2+1=3, 2+1=3
Day & Date : Friday, 29/07/2011

Academic Year : 2010-2011
Subject/Paper Title : Animal Nutrition-I
Total Marks : 30 + 30
Time : 10.00 to 13.00 hrs.

Note : 1) Use Separate Answer Book for each course.

- 2) Solve Any Three questions from Section – 'A' of each course.
3) All questions from Section – 'B' of each course are compulsory.
4) Draw neat and well labeled diagram wherever necessary.

ANN-111 (2+1)

Principles of Animal Nutrition and Feed Technology

(Marks -30)

SECTION – 'A'

- Q. 1. A) Compare plants and animal body composition. (02)
B) Explain partitioning of food energy into its components. (02)
- Q. 2 A) Discuss methods of hay making with losses. (02)
B) Explain changes occur during silage making with losses. (02)
- Q. 3 Classify different feedstuffs with suitable examples. (04)
- Q. 4 Discuss various feed processing methods for improving nutritive value of roughages. (04)
- Q. 5 Enlist different methods of protein quality evaluation for non-ruminants and describe any one of them in detail. (04)

SECTION – 'B'

Q. 6 Give Two examples of the following.

- i) Non legume fodder
ii) Legume fodder
iii) Oil seed cakes
iv) ~~Byproduct of rice~~ → Rice straw, Rice bran (Churni)
v) Animal by-product → Meat milk,
vi) Sugarcane plant by-product → Molasses bagasse

Q. 7 Define the following.

- i) Nutrient
ii) Maintenance ration
iii) Additive
iv) Ration
v) Major elements
vi) By-pass protein
vii) Essential fatty acids
viii) Essential amino acids
ix) Supplement
x) Respiratory quotient
xi) Haylage
xi) TDN

(06)

Q. 8 (A) Choose the most appropriate answer from the given options. (03)

- i) Swollen hock syndrome in chicks due to deficiency of
 - a) Mn
 - b) Zn
 - c) Ca
 - d) Fe
- ii) Anaemia is due to deficiency of
 - a) Ca
 - b) Fe
 - c) Zn
 - d) P
- iii) Sulphur containing amino acid is
 - a) Glycine
 - b) Arginine
 - c) Methionine
 - d) Valine
- iv) Steely wool in sheep is due to deficiency of
 - a) Se
 - b) Fe
 - c) Mn
 - d) Cu
- v) Night blindness is caused due to deficiency of
 - a) Vit. D
 - b) Vit. A
 - c) Vit. K
 - d) Vit. E
- vi) White muscle disease is caused by deficiency of
 - a) Vit. A
 - b) Vit. D
 - c) Vit. E
 - d) Ca

(B) Match the following.

(03)

	Column 'A'	Column 'B'
1)	Thiamine	a) Curled toe paralysis
2)	Niacin	b) Beri-beri
3)	Cyanocobalamin	c) Pellagra
4)	Riboflavin	d) Pernicious anaemia
5)	Calcium	e) Pica
6)	Phosphorous	f) Osteomalacia

ANN-121 (2+1)

Applied Nutrition-I (Ruminants)

(Marks - 30)

SECTION - 'A'

- Q. 1 A) Enrichment of straw with urea-molasses. (02)
- B) Feeding habits of goat. (02)
- Q. 2 A) Calf starter ration. (02)
- B) Elaborate the steps in determining the digestibility trial in cattle. (02)
- Q. 3 A) Enlist feeding experiment and explain any one of them. (02)
- B) How protein requirement for maintenance are determined. (02)
- Q. 4 What is balance ration? Write in details about the characteristic of a balance ration. (04)
- Q. 5 Describe feeding of calves from zero to three months age. (04)

SECTION 'B'

Q.6 Match the following.

(06)

Column 'A'	Column 'B'
i) Kellner	a) USA
ii) ARC	b) NE
iii) NRC	c) Book entitled 'Feeds and Feedings'
iv) External indicator	d) Rich in antibiotics
v) Thaer	e) Chromic oxide
vi) Armsby	f) Rich in soluble carbohydrates
vii) Morission	g) Hay value
viii) Agro industrial by products	h) UK
ix) Molasses	i) SE value
x) Colostrum	j) Bagasse
xi) Internal marker	k) Source of phosphorus
xii) Wheat bran	l) Silica

Q.7 State whether the statements are "True or False" and rewrite the sentence after necessary corrections, if necessary. (06)

- i) Chromic oxide marker is commonly used in the indirect method of digestibility trial in non-ruminants. **F**
- ii) Calf starter is the first dry feed offered to a calf. **T**
- iii) Digestibility of a feed increases as the plant matures. **F**
- iv) Urea-Molasses liquid diet contains 5.5% urea.
- v) Apparent digestibility of feed is always lower than the true digestibility. **T**
- vi) At 4th week of age a calf should get milk @ one-tenth of its body weight.
- vii) 1 kg TDN is equivalent to 3.6 Mcal of ME. **T**
- viii) Proteins of a calf starter ration should have all essential amino acid.
- ix) A marker should be pharmacologically inactive and have an incomplete excretion through faeces. **F**
- x) Overfeeding to breeding bulls increases libido.
- xi) Pre-experimental feeding period for a digestion trial for large animals is generally 7 days.
- xii) After the rumen becomes functional, milk feeding to the calves should be discontinued. **T**

Q.8 Define the following.

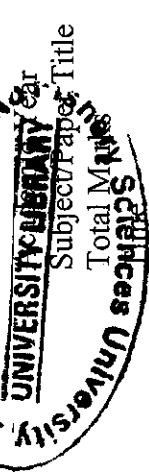
(06)

- i) Digestion trial
- ii) Metabolic trial
- iii) Collection period
- iv) Germ free technique
- v) Internal indicator
- vi) External indicator
- vii) Apparent digestibility
- viii) True digestibility
- ix) Challenge feeding
- x) Browsing
- xi) Flushing
- xii) Feeding trial

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ANNUAL THEORY EXAMINATION, B.V.Sc. & A.H.

Year : I (New Course)
Course No. : ANN-111, 121
Credits : 2+1=3, 2+1=3
Day & Date : Wednesday, 18/07/2012

: 2011-2012
: Animal Nutrition-I
: 30 + 30
: 10.00 to 13.00 hrs.



- Note :** 1) Use Separate Answer Book for each course.
2) Solve Any Three questions from Section – ‘A’ of each course.
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4) Draw neat and well-labelled diagram wherever necessary.

ANN-111 (2+1) Principles of Animal Nutrition & Feed Technology (Marks – 30)

SECTION –‘A’

- Q. 1. A) Enlist various trace elements which are dietary essential for livestock feeding. (02)
Discuss the role of copper and iron.
B) Enlist different fat soluble vitamins. Explain the physiological roles of vitamin E (02) and K. (02)
- Q. 2 A) Explain the meaning of biological value of protein and nutritive ratio. (02)
B) Write a short note on protein supplement for livestock feeding. (02)
- Q. 3 A) What are the various nutrient losses in the process of hay making? (02)
B) Describe the chemical changes that occur after ensiling. (02)
- Q. 4 What do you mean by direct and indirect calorimetry? How heat production is measured in (04) direct calorimetry? (04)
- Q. 5 Discuss the various methods for improving the nutritive value of low quality feed stuffs. (04)

SECTION –‘B’

- Q. 6 Choose the most appropriate answer from the options given below. (06)
- i) Dry matter content of the crop for silage making is
a) 20% b) 35%
c) 42% d) 49%
- ii) For milk protein, factor used for conversion of Nitrogen content into protein is
a) 6.25 b) 6.38
c) 5.75 d) 5.38
- iii) Subabool contains a toxic factor known as
a) Mimosine b) Salanine
c) Nimbine d) None of these
- iv) Which of the following vitamin is required for conversion of tryptophan into niacin?
a) Thiamin b) Riboflavin
c) Pyridoxin d) Biotin
- v) The RQ of protein is
a) 0.77 b) 0.96
c) 0.85 d) 0.70
- vi) Aflatoxin is a
a) Bacterial toxin b) Fungal toxin
c) Viral toxin d) Protozoal toxin
- vii) Grass Tetany in cattle is caused due to deficiency of
a) Manganese b) Copper
c) Magnesium d) Calcium

- viii) Parakeratosis in swine is caused due the deficiency of
a) Selenium b) Zinc
c) Copper d) Cobalt
- ix) The loss of energy in the form of methane with respect to gross energy intake is to the extent of
a) 6-8% b) 10-12%
c) 14-15 % d) 18-20 %
- x) Trypsin inhibitor is present in
a) Soyabean b) Egg
c) Mustard d) Groundnut cake
- xi) The element which is component of glutathione peroxidases is
a) Zinc b) Copper
c) Copper d) Selenium
- xii) The crude fibre level in roughage is more than
a) 10 % b) 12 %
c) 15% d) 18%

Q. 7 State 'True' or 'False'. If false, rewrite the statement after making necessary corrections only in underlined word(s). (06)

- i) Thumps is caused due to iron deficiency.
ii) Maintenance requirement are those when there is neither loss nor gain in body weight of adult mature animal.
iii) Chemical score of protein is based on the proportion of main limiting amino acid in protein with respect to standard protein.
iv) Grass stagers condition is caused due to magnesium deficiency.
v) Energy value of feed is generally expressed in terms of DCP.
vi) One percent of total body calcium is present in bones.
vii) Kellners starch equivalent values are measured at below maintenance level.
viii) The loss of energy in urine of cattle with respect to gross energy intake is approximately of the order of 12 to 15 %.
ix) Respiratory exchange method is used in indirect calorimetry.
x) Cobalt is related with glucose tolerance in cattle nutrition.
xi) Thiamin and biotin both contain sulphur.
xii) Excess of molybdenum in the diet may induce copper deficiency.

Q. 8 A) Define the following terms. (06)

- i) Metabolizable energy
ii) Indirect calorimetry
iii) Calorie protein ratio
iv) Animal source of protein
v) Silage
vi) Adulterants

B) Match the pairs.

Column 'A'	Column 'B'
i) Animals starch	a) Iron
ii) Ricin	b) Glycogen
iii) Aflatoxin	c) Saccharomyces cerevesiae
iv) Yeast	d) Aspergillus
v) Muscular dystrophy	e) Castor bean
vi) Mucosal block theory	f) Vitamin E deficiency

(03)

SECTION - 'A'

- Q. 1 a) What are various norms adopted for conducting digestibility trial? (02)
- b) What is importance feeding of colostrums in neonatal calves? (02)
- Q. 2 Give reasons for the following.
- a) Why apparent digestibility is lower than true digestibility? (02)
- b) Why readily available energy source is required while using NPN in ruminant diet. (02)
- Q. 3 Describe the method adopted for estimating the protein requirements for maintenance in cattle. (04)
- Q. 4 Discuss in detail feeding of growing kids. (04)
- Q. 5 Write short notes on.
- a) Feeding standards (02)
- b) Scientific feeding (02)

SECTION - 'B'

- Q. 6 Choose the most appropriate answer from the options given below. (06)
- i) Total dry matter consumption in adult ruminant depends on
- a) Body weight
- b) Total protein ration
- c) Energy value of ration
- d) None of these
- ii) Balanced ration should have following characteristics.
- a) Slightly laxative
- b) Least cost
- c) Palatable
- d) All of these
- iii) The MFN value is related to
- a) Metabolic body weight
- b) Type of feedstuff
- c) DM intake
- d) All of these
- iv) Which amino acid is present is highest quantity in wool fibre?
- a) Lysine
- b) Cystine
- c) Arginine
- d) Threonine
- v) Which of the following is external indicator?
- a) Lignin
- b) Silica
- c) Chromic oxide
- d) All of these
- vi) Which of the following is glucogenic VFA?
- a) Propionate
- b) Acetate
- c) Isovalerate
- d) Butyrate
- vii) In hay, equivalent feeding standards is used as unit to compare with other feedstuff.
- a) Lucerne hay
- b) Medow hay
- c) Barley
- d) None of these
- viii) Colostrum is rich in as compared to whole milk.
- a) Minerals
- b) Vitamin A
- c) Immunoglobulin
- d) All of these
- ix) In a dairy ration the digestibility is affected by
- a) Quantity of fibre
- b) Chemical composition of fibre
- c) Both a and b
- d) None of these

- x) Which of the following is not a NPN compound?
 a) Biuret b) Amides
 c) Urea d) Nicotinamide
- xi) Which of the following method is not used for feed formulation?
 a) Differential integration method b) Pearson square method
 c) Simultaneous equation method d) Trial and error method
- xii) The digestibility obtained by conventional digestibility trial is known as
 a) True digestibility b) False digestibility
 c) Apparent digestibility d) None of these

Q. 7 State 'True' or 'False'. If false, rewrite the statement after making necessary corrections (06)
 only in underlined word(s).

- i) TDN can be measured by proximate analysis of feed and faeces in digestibility trial.
- ii) The minimum preliminary period before conducting digestibility trial is about three weeks in case of buffaloes.
- iii) Steaming up increases the breeding performance of ewe.
- iv) Lactose is involved with increased calcium uptake in calves.
- v) It is not safe to provide NPN compounds with a source of soluble carbohydrates.
- vi) Apparent digestibility of CP is more than true digestibility.
- vii) Grinding of wheat straw increases its digestibility.
- viii) Common external indicator for conducting digestibility trial is silica.
- ix) Acetate and butyrate both are ketogenic in nature.
- x) Calcium supplementation two weeks before calving decreases the chance of hypocalcaemia.
- xi) For producing 1 kg of 4 % FCM a cow needs about 330 g TDN.
- xii) Calf starter is a concentrate mixture containing 22% CP and 70% TDN.

Q. 8 A) Define the following terms. (03)

- i) Animal source of protein
- ii) NPN
- iii) Metabolic faecal Nitrogen
- iv) Maintenance requirement
- v) Single cell protein
- vi) Metabolizable energy

B) Match the pairs.

(03)

Column 'A'

- i) Maize gluten meal
- ii) Molasses
- iii) Fish meal
- iv) Maize
- v) Biuret
- vi) Soyabean meal

Column 'B'

- a) NPN compound
- b) Animal source of protein
- c) Byproduct of starch industry
- d) Byproduct of sugar industry
- e) Trypsin inhibitor
- f) Energy supplement
