

Winter Horse Management Webinar Series

Feeding Hay

12.16.20

NDSU

EXTENSION

Nondiscrimination Statement

NDSU does not discriminate in its programs and activities on the basis of age, color, gender expression/identity, genetic information, marital status, national origin, participation in lawful off-campus activity, physical or mental disability, pregnancy, public assistance status, race, religion, sex, sexual orientation, spousal relationship to current employee, or veteran status, as applicable. Direct inquiries to Vice Provost, Title IX/ADA Coordinator, Old Main 201, (701) 231-7708, ndsu.eoaa@ndsu.edu.



In accordance with Federal law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, this institution is prohibited from discriminating on the basis of race, color, national origin, sex, age, disability, and reprisal or retaliation for prior civil rights activity. (Not all prohibited bases apply to all programs.)

Program information may be made available in languages other than English. Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotape, and American Sign Language) should contact the responsible State or local Agency that administers the program or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the Federal Relay Service at (800) 877-8339.

To file a program discrimination complaint, a complainant should complete a Form AD-3027, USDA Program Discrimination Complaint Form, which can be obtained online, from any USDA office, by calling (866) 632-9992, or by writing a letter addressed to USDA. The letter must contain the complainant's name, address, telephone number, and a written description of the alleged discriminatory action in sufficient detail to inform the Assistant Secretary for Civil Rights (ASCR) about the nature and date of an alleged civil rights violation. The completed AD-3027 form or letter must be submitted to USDA by:

mail:
U.S. Department of Agriculture
Office of the Assistant Secretary for Civil Rights
1400 Independence Avenue, SW
Washington, D.C. 20250-9410; or

fax:
(833) 256-1665 or (202) 690-7442;

email:
program.intake@usda.gov

This institution is an equal opportunity provider.

Conforme a la ley federal y las políticas y regulaciones de derechos civiles del Departamento de Agricultura de los Estados Unidos (USDA), esta institución tiene prohibido discriminar por motivos de raza, color, origen nacional, sexo, edad, discapacidad, venganza o represalia por actividades realizadas en el pasado relacionadas con los derechos civiles (no todos los principios de prohibición aplican a todos los programas).

La información del programa puede estar disponible en otros idiomas además del inglés. Las personas con discapacidades que requieran medios de comunicación alternativos para obtener información sobre el programa (por ejemplo, Braille, letra agrandada, grabación de audio y lenguaje de señas americanas) deben comunicarse con la agencia estatal o local responsable que administra el programa o con el TARGET Center del USDA al (202) 720-2600 (voz y TTY) o comunicarse con el USDA a través del Servicio Federal de Transmisión de Información al (800) 877-8339.

Para presentar una queja por discriminación en el programa, el reclamante debe completar un formulario AD-3027, Formulario de queja por discriminación del programa del USDA, que se puede obtener en línea, en cualquier oficina del USDA, llamando al (866) 632-9992, o escribiendo una carta dirigida al USDA. La carta debe contener el nombre, la dirección y el número de teléfono del reclamante, y una descripción escrita de la supuesta acción discriminatoria con suficiente detalle para informar al Subsecretario de Derechos Civiles (ASCR) por sus siglas en inglés sobre la naturaleza y la fecha de la presunta violación de los derechos civiles. La carta o el formulario AD-3027 completado debe enviarse al USDA por medio de:

correo postal:
U.S. Department of Agriculture
Office of the Assistant Secretary for Civil Rights
1400 Independence Avenue, SW
Washington, D.C. 20250-9410; o

fax:
(833) 256-1665 o (202) 690-7442;

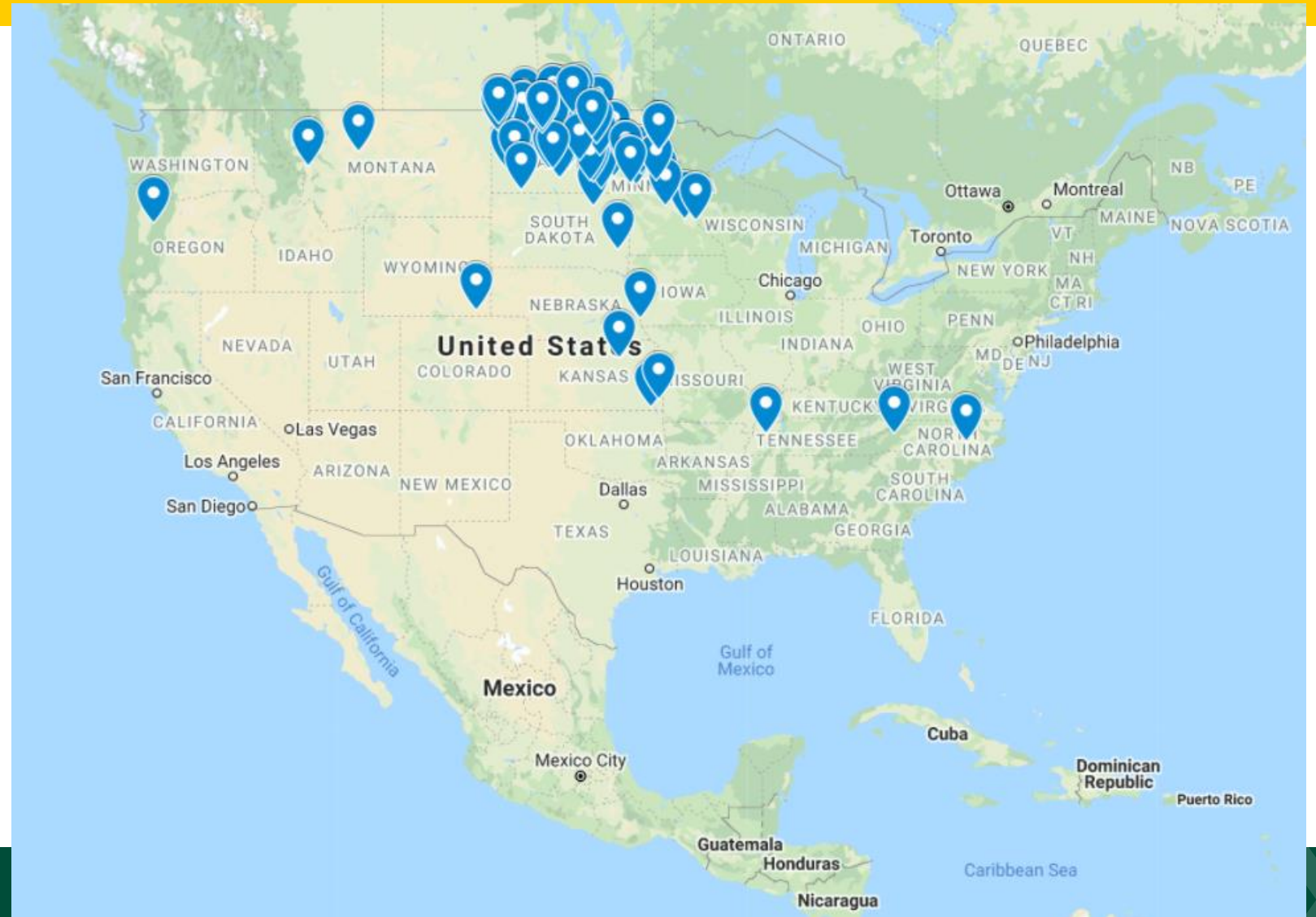
correo electrónico:
program.intake@usda.gov

Esta institución ofrece igualdad de oportunidades.

Locations and Numbers

- Germany
- Italy

- 1-5
- 25-50
- 75-150

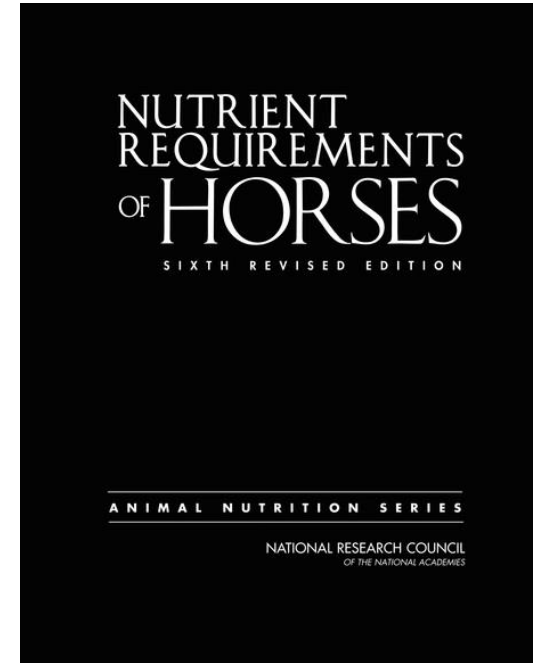


Speakers

- **Leigh Ann Skurupey, Ph. D.**, leighann.skurupey@ndsu.edu
 - Nutrient requirements
 - Digestive system basics
- **Paige Brummund**, paige.f.brummund@ndsu.edu
 - Hays available in ND
 - Feeding during the winter
- **Rachel Wald**, r.wald@ndsu.edu
 - Determining hay quality

2007 Nutrient Requirements of Horses (NRC)

- Contains a combination of requirements and allowances
- Requirements are based on:
 - Data collected from horses
 - Extrapolation of research in other livestock
 - “Professional judgment”



Bottom Line: values in the 2007 NRC represent requirements of the “average” horse (*works well for most, but not all horses*)

Nutritional Requirements – Influences

ADDRESSED BY NRC “Classes”	OTHER FACTORS
<ul style="list-style-type: none">• Body weight• Age• Growth rate• Milk Production• Pregnancy• Level of activity	<ul style="list-style-type: none">• Climate & environment• Digestive and metabolic differences between horses• Variation in production, performance capabilities• Health status• Previous nutrition status• Variation in digestibility• Interrelationships among nutrients



Horses should be fed as individuals

Key Nutrients:

1. Water
2. Energy
 - a. Carbohydrates
 - b. Fats
3. Protein
4. Vitamins
5. Minerals



Critical Winter Nutrient:

Water

- Decreased consumption --> risk of impaction colic
- Access to water
 - Break ice often!
- Decreased consumption during winter
 - Salt



Critical Winter Nutrient:

Energy

- ~ 25% higher
- Lower critical temperature (LCT)
 - Horse starts to use more energy to maintain body warmth
 - Dependent on:
 - Hair coat
 - Piloerection – hair erector muscles change hair direction
 - Body fat
 - Provided shelters
 - Type of blanket



Lower Critical Temperature (LCT)

LCT
45° F



LCT
30° F



Fiber is Critical to a Horses Diet

- Roughages – Feeds with min of 18% crude fiber
 - Fiber is needed to maintain the motility & digestive function of the GIT
- Roughages should make up the majority of the diet for ALL horses
 - Forages are key to producing heat
 - The hindgut is your horse's furnace!
 - Winter months: 1.5 to 3% of BW
 - Body Condition Score (BCS)



Basic Equine Digestive System

Foregut's job:

Break down & absorb

- Protein
- Carbohydrates
- Fats

Mouth

Stomach
8 - 19 qts.

**FOREGUT = Stomach
+ Small Intestine**

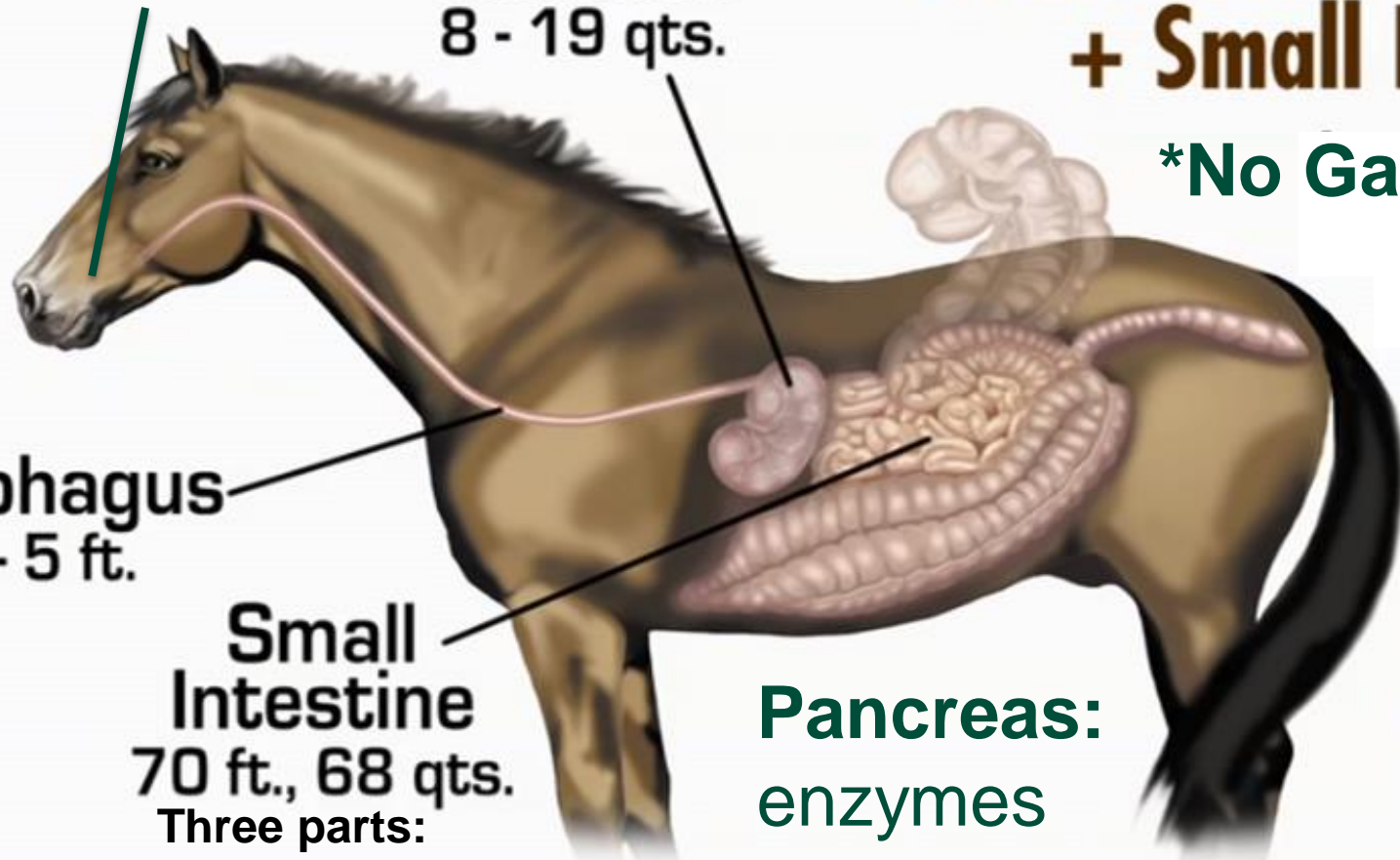
***No Gallbladder**

Esophagus
4 - 5 ft.

Small Intestine
70 ft., 68 qts.
Three parts:

duodenum, jejunum, ileum

Pancreas:
enzymes



Basic Equine Digestive System

HINDGUT = Cecum + Colon

Cecum

(right side of abdominal cavity)

4 ft., 28 - 36 qts.

Internal Combustion Site



Small Colon

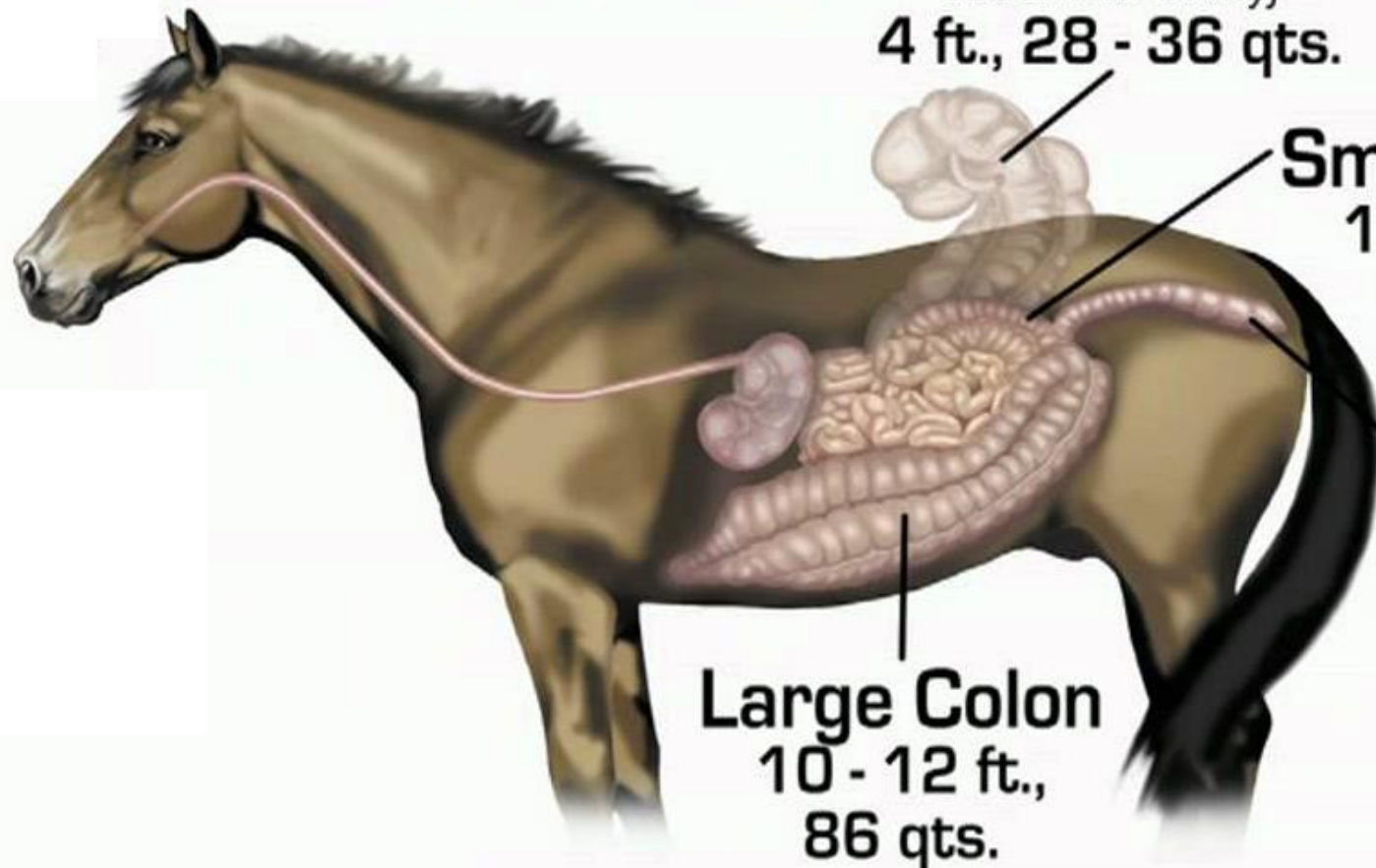
10 - 12 ft.
16 qts.

Rectum

1 ft.

Large Colon

10 - 12 ft.,
86 qts.



Hindgut's job:

Break down & absorb

- Fiber
- Microbial population secretes:
 - B Vitamins
 - Vitamin K
- Water absorption

TAKE HOME MESSAGE

The major nutritional concerns for winter:

- Adequate **calories** (energy) to maintain good body condition
- Adequate fiber to increase/maintain internal body heat
- Adequate water intake to prevent impaction colic
- Every situation is different
 - Analyze your horse's workload, housing and body condition to determine if a change in feed is necessary.

Common Types of Hay Available in ND

- Grass
 - Cool season
 - Warm season
 - Annual forages
- Legume: alfalfa
- Mixed Hay
 - Smaller amounts of alfalfa, test closer to grass
- Buy the type of hay that matches your horses diet needs
 - Immature hay more nutrient dense than mature hay

Common Types of Bales Available in ND

- Large Rounds
 - Soft or solid core
- Large Squares
- Small Squares



- Bale Wrap/Twine
 - Sisal twine
 - Plastic twine
 - Net Wrap
 - B-Wrap



Pricing Hay in ND: Bale vs. Ton

- Purchase by weight
- Comparison Formula
 $(2000 \text{ lbs} \div \text{bale weight}) \times \text{bale price}$
= Cost per ton
- Which bale costs less?
 - a.) \$55/bale, weight is 800 lbs
 - b.) \$85/bale, weight is 1400 lbs

Sourcing Hay in ND

- Where to find hay
 - Local connections
 - Online/Web Listings
 - Feed Stores
 - National Hay Suppliers
 - Hay Auctions
- Trucking hay
 - Around \$4 +/- per mile
 - Typically delivered by a "full truckload"
 - Load size will vary depending on size of trailer
- Consider safety, experience, and available equipment if hauling yourself

Storing Hay in ND

- Storing Hay

- Covering

- Stacking

- Do not stack higher than your equipment can safely reach
 - Do not stack in low areas
 - Sturdy stacks

- Moisture

- Ideal 10-16%
 - Mold above 18%
 - Heat damage and fire risk over 25%



Feeding Hay in ND Winters

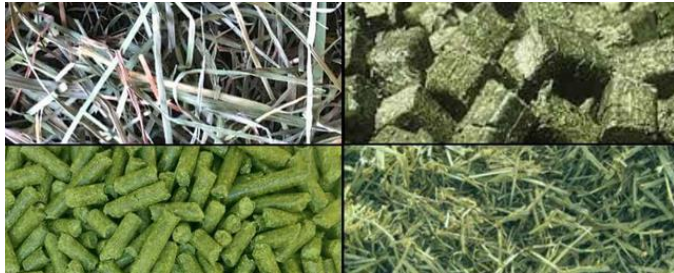
- Increase forage intake by 2lb for every 10 degrees below the LCT
 - Free choice access during extreme cold
- Lower Critical Temperature:
 - Healthy adult horses: 5°F
 - Young, old, thin: 12°-32°F
 - Dry hair coat vs. wet hair coat



- Feed placement:
 - behind windbreaks, close to shelter and water sources
 - away from snow drifts, away from buildings, gates, doors, and low spots

Stretching Your Hay Resources

- Replace with a pelleted, cubed, or vacuum-packed forage



- Replace with a complete feed
- Supplement hay with a concentrated feed
- Feed older hay

- Feed lower quality hay free choice, portion out higher quality hay
- Reduce waste
 - Limit feeding
 - Using a feeder or net
- Resist the urge to turn horses out to pasture early

Determining Hay Quality

- Moisture content
- Palatability
- Foreign objects
- Noxious weeds, unpalatable weeds
- Smell
- Color



Testing Hay for Nutritional Value

- How to Take a Sample
 - Check out probe from Extension office
- Where to send a sample
 - Cost
- Results
 - Sampling Feed for Analysis (AS1064, Reviewed Dec. 2018)



Feeding Hay

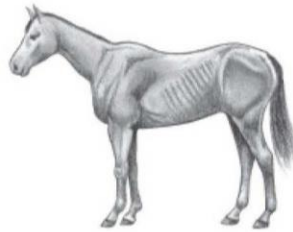


- How much
 - Free choice vs portioned out
- Feeders
- Reducing Waste

Monitoring Body Condition

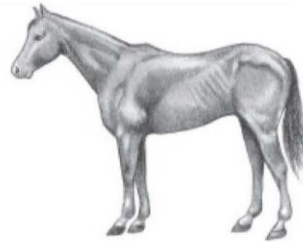
1 Poor

Animal extremely emaciated; spine, ribs, tailhead, points of hip and buttock projecting prominently; bone structure of withers, shoulders, and neck easily noticeable; no fatty tissue can be felt.



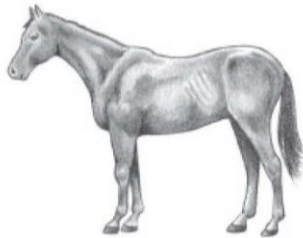
2 Very Thin

Animal emaciated; slight fat covering over base of spine, ribs, tailhead, points of hip and buttock prominent; withers, shoulders, and neck structure faintly discernible.



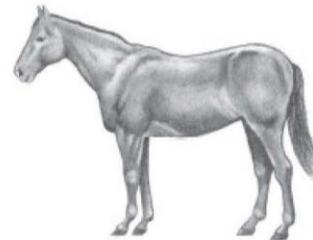
3 Thin

Fat buildup about halfway on spine, slight fat cover over ribs; spine and ribs easily discernible; tailhead prominent but individual vertebrae cannot be identified visually; points of hip appear rounded but easily discernible; points of buttock not distinguishable; withers, shoulders, and neck accentuated.



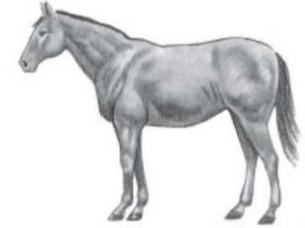
4 Moderately Thin

Slight ridge along back; faint outline of ribs discernible; tailhead prominence depends on conformation, fat can be felt around it; points of hip not discernible; withers, shoulders, and neck not obviously thin.



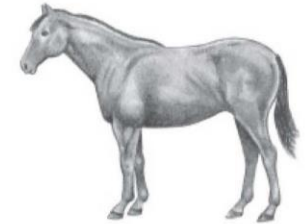
5 Moderate

Back is flat (no crease or ridge); ribs not visually distinguishable but easily felt; fat around tailhead beginning to feel spongy; withers appear rounded over spine; shoulders and neck blend smoothly into body.



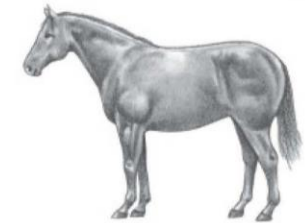
6 Moderately Fleshy

May have slight crease down back; fat over ribs fleshy/spongy; fat around tailhead soft; fat beginning to be deposited along sides of withers, behind shoulders, and along side of neck.



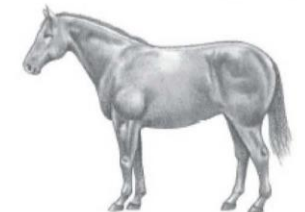
7 Fleshy

May have crease down back; individual ribs can be felt; but not noticeable filling between ribs with fat; fat around tailhead soft; fat deposited along withers, behind shoulders, and along neck.



8 Fat

Crease down back, difficult to feel ribs; fat around tailhead very soft; area along withers filled with fat; area behind shoulders filled with fat; noticeable thickening of neck; fat deposited along inner thighs.



9 Extremely Fat

Obvious crease down back; patchy fat appearing.

Resources

- Determine Horse Nutrient Requirements
 - <https://nrc88.nas.edu/nrh/>
- Hay probe
 - Contact your local NDSU Extension agent:
<https://www.ag.ndsu.edu/extension/directory/counties>
- Sampling Feed for Analysis
 - <https://www.ag.ndsu.edu/publications/livestock/sampling-feed-for-analysis>
- Quality Forage Series: Interpreting Composition and Determining Market Value
 - <https://www.ag.ndsu.edu/publications/livestock/quality-forage-series-interpreting-composition-and-determining-market-value>