

Conservation Evaluation and Monitoring Activity (CEMA)

Feed and Forage Analysis

CEMA 206

Definition

Quantitative testing for nutrient composition of feed and forage using approved laboratory methods implemented by certified laboratories.

The purpose of feed and forage analyses is to provide information to producers and animal nutritionists for use in developing a feed management plan or grazing plan. Intent is to address nutrient management concerns, avoid overfeeding nutrients, and ensure animals are fed properly according to recommendations of the National Academies of Science, Engineering, and Medicine nutrient requirements of domestic animals series.

Applicable Land Uses

This conservation activity applies to any land use where animals are fed.

Qualified Individual Requirements

The Natural Resources Conservation Service (NRCS) strongly encourages participants to know the following Qualified Individual (QI) Requirements to ensure the person they hire is a good match for their needs and objectives.

This CEMA will be completed by a QI. A QI for this CEMA meets the following qualifications:

Bachelor of Science degree in agricultural science, animal science, animal nutrition, biology, veterinary science, or zoology.

General Requirements

- 1) This CEMA includes the performance of work and documentation of the tasks, results, interpretations, and other activities described herein by a QI.
- 2) Prior to initiation of the CEMA, arrange a pre-work conference to ensure all parties understand the participant's objectives, required deliverables, and characteristics of the CEMA tasks.
 - a) The parties in the pre-work conference must include the participant, the QI, and the NRCS field office staff. The parties should agree whether they will join in-person or join via phone, web-meeting, etc.
 - b) If the participant will employ a Technical Service Provider (TSP) to implement a Conservation Planning Activity (CPA) or Design and Implementation Activity (DIA) that will be supported by results of this CEMA, the TSP should be invited to the pre-work conference. Refer to CPA 199 – Conservation Planning.
- 3) A QI may use reference information, resource concerns, conservation practice standards and related documents served in the NRCS Field Office Technical Guide (FOTG) for the state where the CEMA is performed. The FOTG home page hyperlink is:
<https://efotg.sc.egov.usda.gov/#/>

Technical Requirements Applicable to Feed and Forage

Feed Grain Analysis:

- 1) Samples must be of sufficient quantity for analyses and representative of the batch, lot, bag, or bunk. Proper sampling equipment must be used to obtain samples. These may include:
 - a. Grains and ingredients: Use a grain probe to obtain at least 5 samples from various locations throughout the grain storage unit.
 - b. Feed and total mixed rations: Only take samples from freshly blended rations. Obtain approximately 12 hand grabs of the feed or total mixed ration from different locations in the feed bunk.
- 2) Samples must be packaged in air-tight containers (e.g., sealed plastic bags) and sent for analysis as soon as possible or packaged and stored in a freezer until shipped.
- 3) Samples must be sent to laboratories certified by the National Forage Testing Association. A list of those laboratories can be found [at this website: https://www.foragetesting.org/files/ugd/24f64f_2dcdef7684454b8bbedd49db0cf8ec94.pdf](https://www.foragetesting.org/files/ugd/24f64f_2dcdef7684454b8bbedd49db0cf8ec94.pdf).
- 4) Analyses must, at a minimum, include proximate analysis of nutrient composition (i.e., dry matter, ash, crude protein, ether extract, fiber and nitrogen-free extracts). Analyses of neutral detergent fiber (NDF) and acid detergent fiber (ADF) as well as minerals are encouraged.
- 5) Analytical methods approved by the [Association of Official Analytical Collaboration International](https://www.aoac.org/about-aoac-international/) (AOACI) must be used. Here is a link to AOACI's website: <https://www.aoac.org/about-aoac-international/>.

Forage and Pasture Analysis:

Samples must be of sufficient quantity for analyses and representative of the batch, lot, bale, pasture or range. Proper sampling equipment must be used to obtain samples. These may include:

- 1) Hay: Use a core sampler to sample approximately 5% of the lot from various bales.
- 2) Haylage and silage: Obtain approximately 20 hand grabs from several locations across multiple loads.
- 3) Pasture and range: Aim for sampling a total of 20 12-inch x 12-in plots clipped at the approximate height the animals are grazing. For short-grass range, clip plots at 1-inch height. For mid- and tall-grass range clip plots at 2-inch height.
- 4) Samples must be packaged in air-tight containers (e.g., sealed plastic bags) and sent for analysis as soon as possible or packaged and stored in a freezer until shipped.
- 5) Samples must be sent to laboratories certified by the National Forage Testing Association. A list of those laboratories can be found [this website: https://www.foragetesting.org/files/ugd/24f64f_2dcdef7684454b8bbedd49db0cf8ec94.pdf](https://www.foragetesting.org/files/ugd/24f64f_2dcdef7684454b8bbedd49db0cf8ec94.pdf).
- 6) Analyses must at a minimum include proximate analysis of nutrient composition (i.e., dry matter, ash, crude protein, ether extract, fiber and nitrogen-free extracts). Analyses of neutral detergent fiber (NDF) and acid detergent fiber (ADF) as well as minerals are encouraged.
- 7) Analytical methods approved by the [Association of Official Analytical Collaboration](https://www.aoac.org/about-aoac-international/)

[International](https://www.aoac.org/about-aoac-international/) (<https://www.aoac.org/about-aoac-international/>) must be used.

- 8) Collect hay samples consistent with land grant university or accredited lab protocol for tissue sampling for each harvest cycle. Consult the National Forage Testing Association list of Certified Labs for more assistance, using this website: - <https://www.foragetesting.org/links>

Deliverables

The QI must provide documentation showing all the tasks indicated in the **General Requirements** section, the **Technical Requirements** section, and the following sections.

As a minimum, the Feed & Forage analysis document must include:

- 1) Description of how the samples were gathered.
- 2) Field location or location of feed storage or forage.
- 3) Provide a copy of the feed or forage analysis.

Cover Page

Cover page reporting the technical services provided by the QI. Cover page(s) must include the following:

- 1) CEMA name and number.
- 2) Participant information: Name, farm bill program name, contract number (QI obtains contract number from participant), land identification (e.g., state, county, farm, and tract number).
- 3) QI name, address, phone number, email.
- 4) A statement by the QI explaining how they currently meet the Qualified Individual Requirements for this CEMA. Attaching or enclosing a copy of documentation for how the QI requirements are met is encouraged. Examples include:
 - Copy of Academic Transcript
 - Certification Name and Number,
 - License Name and Number,
 - Agricultural Retailer Business Name, or
 - Other brief written statement indicating how the requirements of a QI for this CEMA are met.
- 5) A statement by the QI that services provided meet NRCS requirements, such as:

I certify the work completed and delivered for this CEMA:

- *Complies with all applicable Federal, State, Tribal, and local laws and regulations.*
- *Meets the general requirements, technical requirements and deliverables for this CEMA.*
- *Is consistent with and meets the conservation objectives for which the program contract was entered into by the participant.*
- *Addresses the participant's conservation objectives for this CEMA.*

QI Signature: _____ Date: _____

- 6) A Participant's acceptance statement, such as:

I accept the completed CEMA deliverables as thorough and satisfying my objectives.

Participant Signature: _____ *Date:* _____

- 7) A space for an NRCS reviewer to certify the agency's acceptance of the completed CEMA and, such as:

NRCS administrative review completion by:

Signature: _____ *Title:* _____ *Date:* _____

Notes and Correspondence

- 1) Copies of correspondence between the QI and the participant relating to decision-making and completion of this CEMA.
- 2) Copies of observations, data, technology tool output, or test results prepared during completion of this CEMA.

Deliver Completed Work

- 1) The QI must prepare and provide the participant two sets of all of the items listed in the **General Requirements**, the **Technical Requirements** and the **Deliverables** sections of this document.
- 2) One set is for the participant to keep.
- 3) The other set is for the local NRCS Office.
- 4) The TSP may transmit a set of the completed work to the local NRCS Office, if the participant has authorized it.

It is recommended to provide the NRCS field office an opportunity to review the CEMA deliverables, prior to asking for their acceptance.

References

National Academies of Sciences, Engineering, and Medicine. 2023. *Nutrient Requirements of Domestic Animals series*. Washington, DC: The National Academies Press.

USDA Natural Resources Conservation Service. Field Office Technical Guide.
<https://efotg.sc.egov.usda.gov/#/>

USDA Natural Resources Conservation Service. National Planning Procedures Handbook.
<https://directives.sc.egov.usda.gov/viewerFS.aspx?hid=44407>