Putting NC-BQA to Work Through the Quality Assurance, Critical Management Points© (QACMP)© System

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"Build on what you know" is the operative phrase in the BQA program. The Beef Quality Assurance (BQA) program road map are the Quality Assurance Critical Management Points (QACMP) principles. Cattlemen, employees, veterinarians, nutritionist, other specialists must look for what could go wrong, then figure out ways to avoid having the problem occur. Build practices that allow checking and verifying, document what you are accomplishing and what you intended to do. Design all of the everyday working techniques to avoid having anything go wrong, especially those things that can cause a safety or quality problem. This includes evaluating safety problems that can affect family members and employees.

Hazard Analysis, Critical Control Points (HACCP)

This is a system developed for space flight to prevent problems from happening. If the production team can figure out what might go wrong, the producer can work toward finding ways to prevent the problem. It includes check points along the process. These allow the production team to know if the process is working properly before the animals are marketed. By definition, HACCP is a food pathogen reduction program — presently not possible in beef production. While good management practices (GMP) stress minimizing fecal-oral contamination, they do not ensure that food-borne pathogens are reduced to an acceptable level. A QACMP program will provide an opportunity to learn to work with HACCP procedures.

What it Takes to Make a QACMP Work

Management must make the commitment. Everyone who can influence a quality or safety defect must be allowed to get involved in an operations QACMP program. The production unit must be able to document all the steps in production. Management must recruit the production team to identify and monitor areas of production in which a quality or safety defect could occur.

The QACMP Procedure In a Nutshell

Provide QACMP training for everyone who will be involved in the program. Develop, evaluate and validate the QACMP generic outline. The outline should include a point to point flow diagram of production, methods which will be used to verify the QACMP program is working, corrective actions which will be taken when a problem is identified, and the schedule of reviews.

Outline for Developing a QACMP Program

QACMP: Five Preliminary Steps

Bring together QACMP resources: Assemble a QACMP team.
Ask trusted friends and experts to help you identify areas in production where quality problems and defects can occur. Include the veterinarian, nutritional adviser, extension educator, university specialists, suppliers, neighbors, family and employees to help develop your QACMPs. Each of

these individuals must be willing to make a commitment to brainstorm with you where problems might occur and how to avoid them. They must also be willing to review the final QACMP plan to make sure all the pieces fit and nothing has been over looked.

Describe the raising and distribution of the cattle. Each segment of cattle production will have some differences in their QACMP concerns. For example a cow/calf producer may use pesticides or herbicides on their pastures that would never be a consideration for a feedlot operator. Likewise a feedlot operator might be concerned with feed medication withdrawal times that would not be a problem for a cow/cow or stocker producer.

There is a built-in margin of safety for withdrawal time in the beef industry. The longest withdrawal time for any FDA/USDA/EPA approved product is 60 days, which is shorter than we typically own/manage cattle and 30 days shorter than is required for cattle to be on a corn base diet in the NCFB Program. All cattle producers must be aware of *high residue risk situations* such as marketing cull or non-performing cattle. Non-performing cattle might have organ damage which would prevent the normal clearance of a product.

Identify who gets the cattle & how they use them. Cow/calf and stocker producers are raising cattle that will not leave their operation to enter the food chain. The cattle will either become a production unit or be finish fed. This reduces the residue risk unless sold from the operation to go directly or indirectly through an auction market to a packer. The most important quality defect these producers must avoid is injection site lesions. Injection lesions may last forever and cattle are never too young or old to create this type of quality defect. A quality, well designed and administered health management program will prevent injection lesions by minimizing the need for the use of treatment products.

Feedlot producers send their cattle directly to packers. There is no room for error in withdrawal times or physical injury, such as bruising. Non-performing cattle, while not a large percent of the cattle sold, present serious quality problems for the industry. The quality grade and carcass weight is seldom acceptable.

Develop & verify a process flow diagram. Outline/list ALL of the steps in the production in the operation. Review the list to insure no steps have been forgotten. The members of the QACMP team will evaluate each step for the potential of quality defects occurring. The defects they will look for will include: 1) bacterial contamination which can cause infectious disease in the cattle or employees, 2) chemical usage/contamination which can lead to a violative residue, and 3) physical damage such as injection site damage, bruising or broken needles in muscle.

Meet the requirements for the NC-BQA Good Management Practices* (GMPs) & Standard Operating Procedures (SOPs), including sanitation SOPs (finding ways to prevent or minimize fecal – oral contamination).

Seven Specific QACMP Steps

Identify Potential Problems (hazards: Bacterial, Chemical, and Physical (B-C-P))
Conduct a production analysis to identify potential problems that could occur in the production process. The use of the production flow diagram/outline/list will provide your best guide to insure no area has been forgotten.

The following 15 points must be considered when conducting a quality assurance hazard analysis:

1. Assure SSOP are in place.
2. Review product production & use.
3. Evaluate all ingredients.
4. Evaluate BCP potential for each step.
5. Could BCP reach product or magnify?
6. Could process cause BCP of product?
7. Are hazards addressed by SSOPs?
8. Describe and identify each BCP.
9. Assess significance based on scientific & technical information.
10. Observe the actual operating practices.
11. Be sure it is the usual process or practice.
12. Evaluate everything for possible cross contamination.
13. Review past BCP contamination incidents.
14. Likelihood & severity of occurrence of each BCP hazard.
15. Can preventive measures be built into the process?

Identify Critical Management Points (CMP) A point, step or procedure at which control can be applied to prevent, eliminate or reduce hazards to acceptable levels. *CMPs must be identified in the*

*Available from the author or Nebraska Cattlemen Inc.

production process where potential problems could occur and be prevented and/or controlled. The criteria should be supported by research. The criteria should be specific, quantifiable and provide a yes or no answer. Evaluation techniques should be available at a reasonable cost. It should be possible to monitor the CMP continuously and adjustment if needed should be easily accomplished. There should be a favorable history of control to provide the potential for preventing and or eliminating a bacterial, chemical or physical (BCP) quality or safety problem.

The use of the production flow diagram/outline/list will provide the best guide for identifying where a potential problem might occur and points where training/management activities might avoid having the problem occur.

Questions which will help identify CMPs

Q1: Do preventive measures exist for BCP?
if yes go to Q2, if no = not CMP

Q2: Does this step eliminate/reduce the likely occurrence of BCP hazard to an acceptable level?
if yes = CMP if no go to Q3

Q3: Could unacceptable BCP contamination occur?
if yes go to Q4 if no = not CMP = stop

Q4: Will subsequent step eliminate BCP hazard?
if yes = not CMP if no = CMP

Establish Critical Limits (CL) for CMPs

Critical limits are the maximum or minimum value that must be controlled for each BCP hazard at each CMP. *Limits must be established for preventative measures associated with each critical management point.* Some CLs are regulated by USDA/FDA/EPA/OSHA and others may be needed because they are important to the operation. CLs may differ for different situations. It is important to document the CL for each BCP for each quality assurance hazard identified and if corresponding CMP.

Simply put, how do you know when a production activity you have identified to manage is not being conducted properly. Some are easy to establish and some are not. For example, giving all injections in the neck is a CMP. Any injection not given in the neck is outside the CL. Providing clean water for cattle to drink might be a CMP you identify, but within minutes of cleaning a water trough an animal/bird contaminates the water with feces (outside CL) and you don't know it – the best you can do is follow a reasonable cleaning schedule. Proper handling of cattle (another CMP) is important but sometimes hard to establish rigid CLs other than for training and the supervision by a person whose animal handling judgment (and person designated) you trust.

Establish CMP Monitor Procedures

Each CMP must be monitored to ensure they stay within the established limits set by management. Supervision on a timely basis is the key. The person(s) in a operation is (are) designated to regularly check to make sure the activity is being carried out in a manner that meets the operations (management's) objective (CMP). In plain language, Is anyone checking to make sure it's being done like you intended to have it done or as best it could be done under the circumstances? Whoever is responsible must be trained to perform, to monitor, and to correct as required for the operation. A scheduled check list is useful (a must for some CMP). It is a little like a pilot check list – the time to check the gas is before you take off. The CMP monitoring list will help you keep from forgetting important items. Just about everyone regularly works from lists (to do list – check the propane and buy more if needed before starting a branding). An operations CMP monitoring list may have items scheduled for once daily, weekly, monthly, yearly – but if scheduled, chances are they will get done. See the NC-BQA check list examples for cow/calf and feedlot (feed and products) included in the appendix. Document and sign all records. Summarize monitoring records on a regular basis.

Establish Corrective Actions (CA)

Corrective action must be taken when monitoring determines a critical management point is not within established limits. CAs should include what will be done in the future to prevent the problem from happening again. "What do you do if—" needs to be discussed/decided before something goes wrong. There are two reasons it is important to establish CAs before a problem occurs: 1) the problem maybe corrected faster, 2) the corrective action needed may change the seriousness with which a problem is viewed. For example, what do you do if someone treats an animal, doesn't record the treatment and the animal with a violative residue is released to a packer. Understanding the offense is criminal misdemeanor and a five digit fine might change the view of the seriousness of the problem. The QACMP team can help develop pos-

sible and appropriate corrective actions. Train people to know CAs for each CMP. Be able to demonstrate the CMP is under control and document all CAs taken.

Establish Verification Procedures

Testing and other measurements must be used to verify the program is working properly. For example, liver abscess reports from a packer are appropriate for verifying that a feedlot's liver abscess control program is working. Verification must be ongoing and is in addition to monitoring activities. Verification is a timed or scheduled double check to ensure CMP control and monitoring is being accomplished and is appropriate to the CMP.

Establish Record Keeping Procedures

Keep records that document the management system is being monitored and is working correctly. Any format of records will work so long as they are appropriate to the needs of the QACMP system developed for the operation.

Review current records and determine which ones adequately address CMPs. Adjust records or develop new forms as needed for each CMP identified and CA specified. Identify and train the people who will be working with the records. Make sure all records are dated and signed.

Validate the QACMP Plan

Validation is the scientific and technical basis for CMP determination and CL identified, and by which BCP quality or safety defects can be controlled. Validation should include a third party review and should be done regularly. Validation should reassess potential new BCP concerns. Evaluate all new ingredients, suppliers, production procedures, equipment, and distribution systems.

Summary of BQA/QACMP Current Objectives

The concept of BQA is as simple as thoughtfully and sincerely considering what can go wrong in production which would cause a quality or safety defect and figuring out how to avoid having it go wrong. Management requires monitoring, so it is very important to document and verify the steps taken to avoid quality and safety problems.

Follow the NCBA's National BQA Guidelines or state affiliate BQA guidelines. If a guideline differs between national and state BQA standards, the more stringent guideline should be followed. The NCBA National BQA Guidelines (revised January 1998) are available from the NCBA or the author.

Producers are asked to remember the BQA basics:

Recruit a BQA team; employees, family, affiliates, specialists, experts, suppliers, marketers.
Take a look at what could go wrong.
What will be done when something goes wrong.
Figure out how to avoid it having a problem occur.
Validate the BQA/QACMP plan (including double checks).
Train and educate, followed by organized and scheduled retraining and re-educating.
Develop a timed check list for monitoring and use it.
Document and double check.

BQA good management practices (GMP) will fit profitable and sustainable management objectives. Cattle are never too YOUNG or too OLD to create a quality defect. THERE ARE NO MOST VALUABLE PLAYERS — BQA is everyone's job.

IT IS SIMPLE ECONOMICS: Cattlemen sell performance...animal performance and efficiency is optimized by following GMPs.

CONSUMERS BUY WHAT THEY TRUST: Confidence comes from trust...a trust cattlemen have earned. But there are few cattlemen left...consumers don't know cattlemen and farmers as they once did. Changes in demographics, the government and the media are making it even tougher for cattlemen to survive. The standards required of cattlemen may seem impossible, but raising cattle and being stewards of the land is the life they have chosen.

Where do cattlemen and veterinarians go from here? Get involved — get everyone in cattle production involved. BQA and meeting the needs of consumers is the cattlemen's and veterinarian's business, it is the cattlemen's and veterinarian's future.

Figure 1.
Example: BQA Cow-Calf Feed Checklist

Beef Operation _____ Date _____
Evaluator _____

Pasture Maintenance and Raised Feeds

Water source protected and checked yearly for contamination.
Pastures protected from contamination.
Training for handling pesticides and herbicides.
Pesticides and herbicides stored in protected area away from feed or health products.
Follow FDA/USDA/EPA guidelines for all product use.
All pesticide/herbicide handling equipment checked before each use for delivery accuracy and contamination.
Cattle or harvest withdrawal time established if needed

before allowing cattle to graze.
Proper disposal of used containers.

Purchased Feeds
Evaluation, sampling, and sample storage protocol developed / used.
Receiving/Inventory Log/Record: Source (verified), Date, Description (name, invoice #).
Training for evaluating received / purchased feeds.
Feed storage inspected for contamination before receiving new loads of ingredients.
Feed storage area only used to store feed ingredients (no pesticides, solvents, etc).
Procedures in place to protect feed handling equipment contamination.
All feed handling equipment checked before each use for contamination.

Feed Additives
Receiving Log Record: Source (verified), Date, Description (including serial / lot #).
Stored separate from other feedstuffs.
Use Log Record: Date, dose per ton, ID of animals.
Physical Inventory Log (can be column in use log).
Training for using feed additives

Feed Formulas
Record of all feed formulas.
Medicated feed formulas checked by nutritionist or veterinarian for accurate dosing.
Directions for use, including withdrawal
Training for mixing and quality control sampling/testing for feed mixing.

Batch/Load/Feed Delivery
Batch / Delivery Log/Load (delivery matches feeding plan if needed).
Minimum/Maximum and exception table or chart for ingredients and mixing.
Training (see above).

Cattle Release Withdrawal checked on all feed records.

Figure 2.
Example: BQA Cow-Calf Product Use Checklist

Beef Operation _____ Date _____
Evaluator _____

Cattle Handling Facilities
Inspected for proper function for cattle and human safety before each use.
Handling facilities and equipment properly designed, maintained, and used.

New Cattle Entering The Operation
Receiving Log Record: Source (verified), Date, Description.
Appropriate Health / Import / Transfer / Movement Records.
Cattle Handling Training.
Basic Quality Control:
1. Holding pens and handling alleys properly designed and maintained.
2. Clean feed and water as needed available to cattle on arrival.
3. Visual inspection of cattle on arrival.

Health Management, Mass Medication, and Pesticide Products (Receiving, Storage & Use)
Receiving/Inventory Log/Record: Source (verified), Date, Description (name, serial / lot #).
Stored in protected area: Refrigerated as needed, sun light controlled, locked if required.
Use (Health Management/Treatment) records for all cattle: Date, Animal(s) ID, diagnosis/reason, product, dose, withdrawal & release date.
Cattle Product Use Maps used for health management (includes product and serial / lot #).
Minimum/Maximum and exception table or chart for product use.
Product Handling and Use Training (including MSDS/ Product Inserts/etc.).
No injectables given in the rear leg (rump or round), injectables given Sub Q if possible.
Supplier Agreements and Veterinary Drug Order (as appropriate).
Signed Use Protocols (Health Maintenance, Treatment, Premise Pesticides).
Follow FDA/USDA/EPA guidelines for all product use.
Equipment for delivery properly designed, maintained and used.
Cattle: Chutes, snakes, holding pens, syringes, needles
Feed and Pesticides: Scales, mixers, delivery system.
Proper disposal of used containers.
Withdrawal time established and estimated date for release, (injectables see above)
Residue screening of non-performers (exceptions: reproduction and lameness if no Rx).
Training for processing, health management, mass medication, and pesticide products.

Feed Management
Feed management, mixing and delivery training.
Follow FDA/USDA/EPA guidelines for all product use (Withdrawal time & release established).

Cattle Release
Withdrawal checked on all products used (Health Management & Treatment) records.

All withdrawal times met and LAST test all non-performers (except animals with no Rx history) Release / Transfer form signed.

Figure 3.
Example: BQA Feedlot Feed Checklist

Beef Operation _____ Date _____
Evaluator _____

Feeding Facilities
Feed storage inspected for contamination before receiving new loads of ingredients.
Feed storage area only used to store feed ingredients (no pesticides, solvents, etc).
Water source protected and checked yearly for contamination.
Procedures in place to protect feed handling equipment contamination.
All feed handling equipment checked before each use for contamination.

Receiving Feedstuffs
Receiving Log Record: Source (verified), Date, Description.
Training.
Basic Quality Control:
1. As needed for economic evaluation of feedstuffs, (ex: moisture, protein, etc.).
2. Visual inspection for contaminants (ex: pink seed corn)
3. Source verify high oil feeds (ex: fat from packing plants vs blended fats)
4. Inspect trucks for contaminates (ex: any signs of hauling dangerous materials before feed).
5. Samples of "high risk" feeds stored as per nutritionist recommendations.

Feed Additives
Receiving Log Record: Source (verified), Date, Description (including serial / lot #).
Stored separate from other feedstuffs.
Use Log Record: Date, dose per ton, ID of animals.
Physical Inventory Log (can be column in use log).
Training for using feed additives.

Feed Formulas
Record of all feed formulas.
Medicated feed formulas checked by nutritionist or veterinarian for accurate dosing.
Directions for use, including withdrawal.
Training.

Batch/Load
Batch Log.
Minimum/Maximum and exception table or chart for ingredients and mixing.
Training.

Feed Delivery
Delivery Log/Load Tickets (Delivery matches Call).
Training.

Cattle Release
Withdrawal checked on all feed records.

Figure 4.
Example: BQA Feedlot Product Use Checklist

Beef Operation _____ Date _____
Evaluator _____

Cattle Handling Facilities
Inspected for proper function for cattle and human safety before each use.
Handling facilities and equipment properly designed, maintained, and used.

Receiving Cattle
Receiving Log Record: Source (verified), Date, Description.
Appropriate Health/Import/Transfer/Movement Records.
Cattle Handling Training.
Basic Quality Control:
1. Holding pens and handling alleys properly designed and maintained.
2. Clean feed and water as needed available to cattle on arrival.
3. Visual inspection of cattle (injection blemishes recorded for release LAST screening).

Processing Management: Vaccines, Medications & Pesticide (Receiving, Storage & Use)
Receiving/Inventory Log/Record: Source (verified), Date, Description (name, serial / lot #).
Stored in protected area: Refrigerated as needed, sun light controlled, locked if required.
Use (Processing/Treatment) Records for all cattle: Date, Animal(s) ID, diagnosis/reason, product, dose, withdrawal & release date.
Processing Maps used for processing cattle (includes product and serial / lot #).
Minimum/Maximum and exception table or chart for product use.
Product Handling and Use Training (including MSDS/ Product Inserts/etc.).
No injectables given in the rear leg (rump or round), injectables given Sub Q if possible.
Supplier Agreements and Veterinary Drug Order (as appropriate).
Signed Use Protocols (Processing, Treatment, Premise

Pesticides).
Follow FDA/USDA/EPA guidelines for all product use (Withdrawal time & release established).
Equipment for delivery properly designed, maintained and used.
Cattle: Chutes, snakes, holding pens, syringes, needles.
Feed and Pesticides: Scales, mixers, delivery system.
Proper disposal of used containers.
Residue screening of non-performers.
Training for processing, health management, mass medication, and pesticide products.

Feed Management
Withdrawal time established, release date estimated.
Feed management, mixing and delivery training.
Follow FDA/USDA/EPA guidelines for all product use (Withdrawal time & release established).

Cattle Release
Withdrawal checked for product used (Processing, Mass Med, & Treatment) records.
All withdrawal times met & LAST test all non-performers (except for thoses with no Rx history).
Release / Transfer form signed by each department.

Figure 5. Quality Assurance, Critical Management Points For Cow-Calf Feed Example

Min: Potential site of Minor Problem (s =safety, p =production, q =quality).
Maj Potential site of Major Problem (s =safety, p =production, q =quality).
CMP: Problem will exist if not controlled at this point (s =safety, p =production, q =quality).

Process Or Step	Potential Problem	Criteria or Limits	Monitoring Procedure And Frequency	Corrective or Preventive Action	Records	Verification
Pasture maintenance pest/herb use	Min	Assume contaminated	Observe Record Inspection	Clean and inspect	Inspection record	Evaluate records
Raised feed	Min	Employee training Approved products Withdrawal if require, Disposal of product containers	Sample & test Visual inspection	Quarantine, store until cleaned EPA approved disposal	Production log & test sheet	Evaluate records
Purchased feed	Min	Employee Training	Sample & test Store Visual inspection	Reject load Quarantine, store	Receiving log and test sheet Invoices	Check records Invoices
Feed Additives	CMP-CF1	Invoice date, description and #'s Employee Training Approved products	Additives inventory against inventory balance	Notify - nutritionist Quarantine-withdrawal adjusted for group if need	Receiving log Invoices Use log	Check records Invoice in off (receiving log-use log daily, monthly withdrawal report before releasing
Feed Formulas	CMP-CF2	All formulas managed by nutritionist	Checked by nutritionist Estimated DOF against withdrawal, Batch checked daily	Withdrawal errors Max level chart	Formulation sheets, Batch sheets Feeders log	Check records (for-batch-log) daily as used & before releasing
Batch/Load	Ma	Establish route and sequence Balance min Establish Min/Max & except chart, Employee training	Batch check list Accumulation & total batch/load sheets Daily audit	Withdrawal errors Max level chart	Mill log Batch logs Truck log Feeders log	Balance logs
Feed delivery	Min	Employee training Establish route Loads match call	Balance load total against feeders log daily,	Assign delivery balance load against delivery	Load records: Group feed log	Check records (delivery-call) Re-checked before releasing
Cattle release	CMP-CF3	All withdrawal times met	Records of show list reviewed & balanced	STOP RELEASE	Release form signed	All forms examined before release

Evaluated by:_____ Date:_____

Figure 6. Quality Assurance, Critical Management Points for Cow-Calf Cattle Residue Avoidance Example

Min: Potential site of Minor Problem (s =safety, p =production, q =quality).
Maj: Potential site of Major Problem (s =safety, p =production, q =quality).
CMP: Problem will exist if not controlled at this point (s =safety, p =production, q =quality).

Process Or Step	Potential Problem	Criteria or Limits	Monitoring Procedure And Frequency	Corrective or Preventive Action	Records	Verification
Cow/Bull Health	CMP-CR1	Health/ Nutrition appropriate to operation.	Vet diagnosis of problem Palpation/ Past/BCS/ BSE/ others...	Adjust as vet and examine inject-SQ neck	Production records	Records checked by operator & vet
Calf Health (Birth)	Min	Cow in optimum condition at calving, Environment appropriate to optimum calf Assist as needed Colostrum management Employee training Approved product	Calving management	Adjust as vet and examine injections SQ neck	Calf health records	Check records to see all treatments and procedures recorded
Calf Health Early Management	Maj	Individual ID Health appropriate to operation Withdrawal established Employee training Approved products	Vet diagnosis of problem Date, product, ID, withdrawal	Set withdrawal, SQ neck	Processing records	Check protocol against invoices of products & processing records
Pre-wean Health	Maj	Individual ID Health appropriate to operation Withdrawal established Employee training Approved products	Vet diagnosis of problem Date, product, ID, withdrawal	Set withdrawal SQ neck	Receiving/ Pen/Yard sheet	Check protocol against invoices of products & processing records
Sickness	CMP-CR2	ID, Date, Product Protocol withdrawal establish Employee training Approved products	Vet diagnosis of problem Date, product, ID, withdrawal	Monitor and set withdrawal SQ neck	Calf health record	Check protocol against treatment records
Transfer	Min	Check WD	Check withdrawal Transfer all records w/ cattle	withdrawal Last test non-performers	Check shipping records against individual & group	Check records before releasing
Culling	CMP-CR3	All withdrawal times met	Check withdrawal Transfer all records w/ cattle	withdrawal Last test non-performers	Check shipping records against individual & group	Check records before release

Evaluated by:_____ Date:_____

Figure 7. Quality Assurance, Critical Management Points for Feedlot Feedstuffs, Ingredients, & Additives Example

Min: Potential site of Minor Problem (s =safety, p =production, q =quality).
Maj: Potential site of Major Problem (s =safety, p =production, q =quality).
CMP: Problem will exist if not controlled at this point (s =safety, p =production, q =quality).

Process Or Step	Potential Problem	Criteria or Limits	Monitoring Procedure And Frequency	Corrective or Preventive Action	Records	Verification
Feed Facilities	Min	Assume contaminated	Observe/record Inspection	Clean and inspect	Inspection record	Records, mill and main office
Receiving Feedstuffs	CM P-F1	Source verified Invoice date, description Employee training Only approved products	Sample every load, test & store Visual inspection product & truck	Reject load Quarantine. Store until cleaned EPA approved disposal	Receiving log and test sheet Invoices	Check records Invoices in office (receiving log-test log-in) by feeding management daily, nutritionist monthly
Feed Additives	CMP-F2	Source verified Invoice date, description and #'s Employee training Only approved products	Additives inventory daily-as appropriate, Against inventory balance	Notify manager nutritionist- Check batch record against group Quarantine/ withdrawal adjusted for group if need	Receiving log Invoices Use log	Check records invoice in office (receiving log-use log daily, monthly Withdrawal report before releasing
Feed Formulas	CMP-F3	All formulas managed by nutritionist	Checked by nutritionist Est DOF against withdrawal Batch checked daily	WD errors Max level chart	Formulation sheets, Batch sheets Feeders log	Check records (for-batch-log) daily & before releasing
Batch/Load	Maj	Establish route and sequence Balance min Establish Min/Max & except chart Employee training	Batch check list Accumulation & Total batch/load sheets Daily audit	WD errors Max level chart	Mill log Batch logs Truck log Feeders log	Balance logs
Feed Delivery	Min	Employee training Establish route Loads match call	Balance load total against feeders log daily,	Assign delivery balance load against delivery	Load records: Group feed log	Check records (delivery-call) Re check before releasing
Cattle Release	CMP-F4	All withdrawal times met	Records of show list reviewed & balanced	STOP RELEASE	Release form signed	All forms examined before release

Evaluated by:_____ Date:_____

Figure 8. Quality Assurance, Critical Management Points for Feeder Cattle Residue Avoidance Example

Min: Potential site of Minor Problem (s =safety, p =production, q =quality).
Maj: Potential site of Major Problem (s =safety, p =production, q =quality).
CMP: Problem will exist if not controlled at this point (s =safety, p =production, q =quality).

Process Or Step	Potential Problem	Criteria or Limits	Monitoring Procedure And Frequency	Corrective or Preventive Action	Records	Verification
Cattle Receiving	CMP-R1	Assume contaminated	Observe/record variation	Sort and examine	Receiving Record	Records foreman office
Processing Products	Min	Group ID Name/serial #'s Withdrawal time Employee training Approved products	Set clear dates Inventory	Establish min sale date for group	Receiving/ Pen/Yard sheet	Check records (receiving-feed-hospital-main) before releasing
Health Management	Maj	Individual ID Release/ withdrawal time established Employee training Approved products	Check projected DOF against withdrawal Inventory	LAST test non-performers	Receiving/ Individual health	Check records (receiving-feed-hospital-main) before releasing
Mass Med	Maj	Group ID Withdrawal time Approved products	Check projected DOF against withdrawal Inventory	LAST test non-performers	Receiving/ Pen/Yard sheet	Check records (receiving-feed-hospital) before releasing
Feeding Management	Min	Release/ withdrawal time established Employee training Approved product	Inventory medications daily	Lock and separate	Mill log Pen log	Balance logs and inventory
Pesticides Management	Min	Employee training Pesticide use plan Approved products	Inventory pesticides (Individual = daily, group =weekly, Yard =monthly)	Lock and separate	Use records: 1) Individual 2) Premise	Check records (receiving-feed-hospital-main) before releasing
Yard Release	CMP-R2	All withdrawal times met	Records of show list reviewed /balance by department	STOP RELEASE	Release form signed / department	All forms examined before release

Evaluated by:_____ Date:_____

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