Quality Assurance (QA) in South African Animal Feed Industry

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Afgri
Position of animal feed industry

Animal Feed
↓
Livestock farming
↓
Processing industry
↓
Retail
↓
Consumer
Objective of structured QA program for entire SA feed industry

- Produce, deliver and feed animal feeds safe to:
  - Consumers of animal products
  - Animals consuming feed
  - Environment

- Produce and supply animal feeds in a trustworthy way for all stakeholders
  - Partners in chain
  - Consumers
  - Legislators

- Must safeguard products in demonstrable and transparent way via certified quality guarantee system
  - Basis for license to produce
Triggers to enhance QA program in global feed industry

Initial triggers – QA system largely re-active:
• Salmonella in eggs and poultry meat (1988)
• High aflatoxin in USA maize gluten feed (1989)
• Residue antibiotics in eggs (1988 – 1992)

Triggers for drastic changes – required pro-active approach:
• Dioxin in Brazilian citrus pulp (1998)
• Dioxin in Belgian feed fat (1999)
• Dioxin in German bakery products (2003)
Enhancement in global QA System

• Shift from re-active to pro-active system
  • Involving risk analysis in entire feed production chain by integrating HACCP into GMP standard
  • HACCP also applied in EU food industry
  • Link feed chain to food chain

• Upstream extension of quality assurance
  • To all suppliers of feed ingredients

• Development of early warning system
  • Report incidental unacceptable contamination despite all precautionary and controlled measures
  • Tackle problems at an early stage

• Improvement of communication
• Feed Quality

• Feed safety as part of food safety is highest priority

• Nutritional, technical and emotional quality of feed also important for common industry policy

• Lower priority then feed safety
Animal feed chain - part of food chain

• Control of product safety non negotiable for gaining and maintaining public confidence in food safety and undisturbed sales of food products

• If food safety cannot be guaranteed:
  1. Stagnation of sales
  2. Decreased consumer confidence
  3. Negative financial impact for companies participating in food chain
  4. Need for safety requirements in legislature and retail trade increases
South African QA
Scenario and Progress
Made

Animal Feed Manufacturers Association
Codes of Practice/Protocols

1. GMP as National Standard for Animal Feed Production
2. GMP Transport Protocol for Raw Materials
3. Control of Salmonella in the Production of Animal Feed
4. Control of Mycotoxins in the Production of Animal Feed
5. BSE Protocol for the use of Mammalian Proteins in Animal Feeds
6. Sampling Protocol for Animal Feeds and Ingredients
7. Code of Conduct for AFMA Members
Good Manufacturing Practice (GMP)

• Feed and food scares
  • Quality must be assured by at least a recognised basic quality guarantee system

• SA industry must adhere to global norms and standards to be internationally competitive
  • Require internationally accepted GMP Code of Practice
    • Also ensures traceability as minimum requirement by first world importers
Good Manufacturing Practice (GMP)

• GMP code of Practice for SA feed industry drawn up

• Covers:

1. Trade and production of compound feed
2. Simple and moisture-rich animal feed
3. Animal feed ingredients
4. Premixes

• Ensures that:

1. Delivery of products and services of feed products and providers of services **consistently** meet requirements laid down by law with regard to human, animal and environmental safety
Good Manufacturing Practice (GMP)

• GMP code

• Compatible with latest Codex Alimentarius code

• Based on HACCP approach using Dutch GMP Code as base document
  • Based on risk analysis approach and consists of:
    • Risk assessment
    • Risk management
    • Risk communication

• Part of a submission on Regulations and Guidelines that will be incorporated into new Agricultural Production Enhancement Agents Act
  • Will only be enforced under the new Act
  • All feed mills will eventually have to comply to GMP
    • Some already comply to international ISO and HACCP standards

• Level of compliance will depend on type of feed produced (medication used) and whether sold or not
Good Manufacturing Practice (GMP)

• GMP code

• Responsible organisations for draft:
  • AFMA, Government, SABS, Parastatals

• Draft 4 completed mid 2008
  • Expected completion date - end of 2008/beginning of 2009

• Process to follow:
  1. Voting on document (done)
  2. Legal and technical adjustments to fit SABS requirements (in process)
  3. Publishing on SABS website and sent for public comments to all standard writing authorities (in process)
  4. Becoming legal national SABS standard
Good Manufacturing Practice (GMP)

• **GMP code**

  • **Focal points**
    • Generic control measures for production, trade and transport
    • Management of veterinary medicines and additives
    • Control of undesirable materials
    • Ensuring hygiene and safety (microbiological aspects)

• **Allow us to deliver products and services that comply with all quality standard requirements**

  • Includes standards and conditions laid down in animal feed legislation

  • Supplemented with standards agreed with next link in animal production chain
GMP Transport Protocol for Raw Material ingredients

- Approved by Technical Committee in 2008 by AFMA
  - Wait for approval by Trade Committee

- Adapted from GMP standard for road transport in animal feed sector, Productschap Diervoeders (The Hague, April 2003)

- Target group
  - All road transporters transporting RM for the animal feed manufacturing industry
    - Either directly or indirectly to feed manufacturing or storage facilities
    - Must register with AFMA as a transporter

- Monitoring
  - Done by AFMA members
    - Audits and results forwarded to AFMA
Participation in Integrated Chain (Quality) Control is a ‘must’

- Retail driven!
- Attention turns to controlling various critical steps in overall production process
  - Rather than expensive end product inspections
Codes of Practice/Protocols

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Salmonella

- Animal feed still major source of infection in poultry flocks
  - High risk raw materials
  - Recontamination of feed post manufacturing (e.g. poor hygienic conditions)

- Standards and control measures have been laid down in SA Animal Feed GMP code
  - Aimed at:
    - Processing phase during feed production
    - Supply of salmonella-critical feed materials
Salmonella

• Code of Practice within framework of GMP code (November 2004)
  • Based on similar code accepted by Productschap Diervoerder in The Hague (January 2003)

• Purpose:
  • Identify and control high risk raw ingredients and critical control points in production process
    • Main focal areas for salmonella control:
      • Premises, transport, feed ingredients, compound feed
  • Define actions if positive sample is found
Salmonella

- Code of Practice within framework of GMP code (November 2004)
  - Monitoring program in accordance with protocols for each salmonella-critical feed ingredient and final products
  - Includes list of Salmonella critical raw materials, dangerous salmonella types, SANAS approved test laboratories (detection and/or serotyping) and ISO accredited methods (e.g. 6579) for analysis
- AFMA maintains database on feed ingredients and final products
  - Feed mill monitoring to follow
  - Seen as an early warning system to create awareness and protect humans and animals
Mycotoxins

- Unique analytical challenges (detection not exact)
  - Representative sampling – greatest chance for error
    - Sample heterogenous
  - Analysis at low regulatory limits of control required
  - Cost

- Detoxifying feeds on a continuous basis is also expensive and ineffective
  - Makes it very difficult for feed companies to take sole responsibility for mycotoxin contamination
Mycotoxins

• All local organisations in feed-food chain need to cooperate to successfully address mycotoxicosis.

• AFMA expressed a need for an early warning management system.
  • Should identify high-risk commodities.
  • Should identify problems in early phases of feed and food chain.
    • Based on weather patterns, geographical areas, seasonal changes, storage and handling.
Mycotoxins

• AFMA initiated development of National Mycotoxin Information System

• CSIR, SABS, SAGL, Maize Trust, etc. involved in projects

• Steering committee with conveners had 3rd meeting – 16 April 2008

• Focus areas assigned to conveners:
  1. Guidelines for mycotoxins in feed and food
  2. Establishment of Mycomap
  3. Establishment of Prediction Model
  4. Identification of risk areas where mycotoxins occur
  5. New areas of research in mycotoxins
Mycotoxins

- Code of Practice - has been drafted (June 2003)

  **Purpose:**
  - Overview on Mycotoxins
  - Guidelines for establishing Good Practices for the control of mycotoxins in the feed industry
  - Interim guidelines on maximum acceptable levels in SA feeds until local and/or international accepted regulations are set
    - Follow principles proposed by Food & Agriculture Organisation (FAO, EU)
    - Based on large variety of studies on mycotoxins published world-wide
Mycotoxins

• Code of Practice
  • Sets sampling and testing procedure
  • Based on SA regulations
    • Takes guidance from Codex Alimentarius Commission of the Food & Agriculture Organisation (FAO, EU) and Food & Drug Administration (FDA, USA)
  • Reviewed continuously by AFMA
BSE and the use of animal by-products in feeds

• Voluntary ban on use of MBM and BM implemented since 1997 and 1999 respectively

• Ban supported by Feedlot Association

• According to GBR (EFSA rating), South Africa is categorised as level 3 by SSC of the EC
  • Likely but not confirmed that domestic cattle are clinically or sub clinically infected with BSE agent
  • Need to get to level 1 (BSE-risk free)
BSE and the use of animal by-products in feeds

Following EFSA visit in 2007, Directorate Veterinary Services undertook evaluation

- Following shortcomings required by OIE have been identified:
  1. MBM regulation not in place
  2. Lack of traceability system
    - What comes into country and final destination
  3. Lack of sufficient high risk samples

- In mean time DoA audits routine samples for use of MBM
  - No positive cases reported yet
  - Did discover illegal imports that were destroyed and actions taken

- Surveillance process by DoA continues
  - Sample numbers for high risk cases are not met yet
**BSE and the use of animal by-products in feeds**

- AFMA completed BSE protocol in 2008 defining traceability systems
  - Still not accepted due to continues changes in requirements/goals
    - Acts 35 and 36 will assist to finalise new protocol document
      - “SA Feed Traceability Protocol for compliance to BSE Risk Management”
      - Include non AFMA members
  - More focus on traceability of overall Livestock and Animal Feed Industry to adhere to international standards set by OIE
    - Includes guidelines for full and extensive auditable traceability system
      - Will have to be inspected by an accredited third party
      - Defines key requirements for handling and feeding of prohibited materials in the feed industry
  - Use as input for quarterly Livestock and Animal Feed Industry Forum
    - Base document for National Animal Feed Protocol
BSE and the use of animal by-products in feeds

- Workshop was held on use of blood meal in animal feed (19 September 2007)

- **Government Gazette notice followed:**
  - Ruminant and/or porcine derived protein can only be used in feeds for dogs and cats
  - DoA was looking to allow use of ruminant blood and blood products in feeds of monogastric animals in addition to predators and carnivores

- **Meeting after workshop indicated that Director Veterinary Services (Act 35) can give exemption for the use of blood meal to any industry group, individual farmer, etc.**
  - Provision is that necessary records (traceability) are made available when required for auditing
  - Decision put on hold – October 29, 2008
  - Waiting for publication of regulation in Government Gazette of allowing blood meal into poultry and pig diets
BSE and the use of animal by-products in feeds

- AFMA’s viewpoint on specific animal/fish protein sources
  - **Blood meal**
    - AFMA has no problem to use it responsibly
  - **Poultry by-products**
    - AFMA has no problem to use it – will continue to use it
    - Some supermarkets have a problem – can create niche markets for certain suppliers
  - **Fish meal**
    - AFMA has no problem to use it – will continue to use it
    - EU ban exists due to possibility of contamination but could be lifted again
Sampling Protocol

Purpose:

• Supply set of guidelines on how to obtain samples of acceptable standard and handle samples when obtained

• Guidelines are used to draw up suitable customer specific SOP’s

  • SOP’s should cover the following on samples:
    • Collection (apparatus, size, method, etc.)
    • ID (number, name, date, etc.)
    • Handling
    • Storage (conditions, location, etc.)

• Minimise disputes/claims on animal feeds based on analytical outcome that does not represent real product

• AFMA determines acceptable methods of analysis and lists them on website
NIR- Revolution in Feed QC
Real time analysis of organic feed component quality and homogeneity
Where can NIR be used in Feed Manufacturing QA?

HACCP points
Viewpoints on other important feed related issues

- GMO’s
- Antibiotics
Genetically Modified Organisms (GMO’s)

- GMO Act (15, 1997) regulates development and use of GMO’s in SA including import and export of living GMO’s
- No scientific evidence that responsible use of the technology itself is inherently unsafe
- Due to the quality and economic benefits of new generation grains and oilseeds, South Africa must use it for human and animal consumption
- AFMA therefore supports development and production of GMO grains and oilseeds to strategically feed an ever-increasing population
- Must however give consumers a GMO/non GMO choice and thereby also explore niche markets
Genetically Modified Organisms (GMO’s)

- AFMA supports the policy and procedure for the evaluation of GMO maize, other grains and oilseeds to ensure that it would not be harmful to the environment, humans or animals.

- SA animal feed relies heavily on imported commodities (high in GMO’s)
  - GMO-free animal feed will be difficult to source in SA
  - Inability to import GMO maize (unapproved events) from specific countries affects import parity
    - Single events have been approved
    - Approval still needed for stacked events
Genetically Modified Organisms (GMO’s)

• Segregation of GMO/GMO-free ingredients and labeling is very difficult

• Price differentials due to cost of segregation and labeling
  • Complicated procedural trial from farm to fork with numerous tests at all stages
  • 15-20% more expensive for labeled foods
    • Who will pay for it - consumer?

• Should DTI not be looking at countries on par with SA how to approach labeling issues (e.g. Argentina)?
• Once GMO product or crop passes all safety checks there is no further need for labeling
Genetically Modified Organisms (GMO’s)

Consumers Protection Bill
- First approved by Cabinet in Dec, 2007
- Introduced into Parliament (May 2008) without mandatory labeling of GMO Foods clause
- Public could make submissions and comments
- Was adopted by National Council of Provinces without inclusion of clause

- Sent to National Assembly
  - Called for submissions (closing date, 29 Aug 2008)
  - Agricultural, food and biotechnology stakeholders did not raise issue again
Genetically Modified Organisms (GMO’s)

Consumers Protection Bill
- Additional meeting was held by the Portfolio Committee of Trade & Industry
  - Stakeholders made oral and written submissions
  - Agricultural, food and biotechnology stakeholders were unaware of meeting
  - Mandatory labeling was re-introduced
- Bill no longer within control of DTI
- Passed by National Assembly (26 September 2008)
  - Waits for Presidential signature
  - Signed off into an Act
Genetically Modified Organisms (GMO’s)

ECONOMIC IMPACT

Business Perspective

• All inputs and outputs will need full traceability and by batch/ crop/ silo clearance certificates and lab reports

• Will not only add costs upfront, but will create further logistic delays and storage costs

• Stock outs will become more common, especially if new demand patterns emerge and insufficient stock is available

• Capital required for the provision of new silos

• Identity Preservation system not in place – SABS
Genetically Modified Organisms (GMO’s)

ECONOMIC IMPACT

Law Enforcement Perspective
• New Inspectorate needs to be formed, trained and put in place
  • Not likely to be budgeted before 2010/2011

Consumer Perspective
• Food Price increases guaranteed
• Choice versus Affordability of Food – Maize/Wheat products

Legal Perspective
• Highly unusual principle is being introduced
  • Product liability and redress, the core essence of the Consumer Protection Bill, is being surplanted with the notion of law to cover perceived fears of product safety
Antibiotics

• Important medicines for the treatment of bacterial infections in humans

• Have been widely used in food animal production since their discovery more than 50 years ago
  • Extremely important tool in the efficient production of eggs, milk and meat

• At sub-therapeutic levels in animal feed, improve growth rate and feed efficiency, reduce mortality and morbidity and improve reproductive performance

• At higher levels (prophylaxis and therapeutic), vital for disease treatment, control and prevention

• Important to ensure healthy food producing animals and thus a safe food supply

• Responsible use helps to advance public health, food safety, animal health and welfare
Antimicrobial resistance:

An antimicrobial agent that was previously effective in killing or inhibiting the growth of a particular microorganism is no longer as effective

Therefore the disease caused by the microorganism will be more difficult or expensive to treat

Possibility that the use of antimicrobials in food producing animals may result in antimicrobial resistance

Transmitted to humans through the food supply chain and lead to adverse health consequences as related antibiotics are used in human medication

Magnitude of the risk has not been quantified
Antibiotics

• AFMA supports responsible use of antibiotics in food animal production
  • To ensure public health, food safety, animal health and animal welfare

• AFMA believes that all antibiotics should be used according to the "Prudent Use of Antibiotics: Global Basis Principles" as elaborated by the international representative organizations of veterinarians, farmers and the animal health industry

• One exception was made to these "Basic Global Principles" to comply with the South African circumstances and legislations:
  • Therapeutic antibiotics, registered under Act 101 of 1965, are prescribed under the supervision of a veterinarian, while such supervision is not necessary for antibiotics registered under Act 36 of 1947
    • Unless it is a condition of registration e.g. for use by or under the control of a veterinarian only
Antibiotics

• AFMA supports sound science as the basis for decision-making and policy development regarding antibiotics in food animal production
  • Antibiotics deemed critical in human medicine should only be used for animal life-saving measures
  • Beyond initial regulatory scrutiny, risk assessments should guide our use of those antibiotics considered important in human medicine

• AFMA believes that all antibiotic use decisions should be based on what serves the best interest of public health and food safety

• AFMA supports all efforts to develop and evaluate alternative growth promoters and the adjustment of management practices to ensure viable and cost-effective drug-free animal production
Antibiotics

• Attention is given to EU trends and bans

• The use of antibiotic free feeds does create niche markets
  • Feed industry is flexible and prepared

• Large poultry operations in conjunction with their feed suppliers have been pro-active
  • Already exclude antibiotics
  • Researched alternatives
  • Ready to switch immediately
Policy document to guide future legislation on animal feeds

• New policy on animal feeds to govern agricultural and pet food sectors
  • Published in the government gazette by Ministry of Agriculture- April 2008

• Framework to guide future legislation to improve the regulation of the animal feeds industry

• Present act is to be repealed and a new feeds act formulated

• States that highly scientific processes have been developed to monitor and test animal feed and concomitant legislative changes have to be introduced

• Acknowledges that feedstuffs play a crucial role in maintaining agricultural productivity at adequate levels to ensure competitiveness in the global food industry
Policy document to guide future legislation on animal feeds

With regards to QA the policy document declares that:

- Global quality standards have to be adhered to in the interests of feed safety

- More punitive measures are required to encourage compliance and to serve as a credible deterrent

- Quicker administrative decision-making is necessary in cases of emergency to protect the agricultural industry and consumers

- Government intends to better monitor on a long-term basis the animal feed production process to prevent the introduction of contaminants and maintain high industry standards
Policy document to guide future legislation on animal feeds

• With regards to QA the policy document declares that:

• A rapid response strategy will be devised to deal with incidents of contamination that arise so that manufacturers and other role players can be timeously informed

• Increased attention will be given to focus on the importation of feeds to ensure compliance with current legislation

• Mycotoxins have a detrimental effect on livestock and more effective monitoring is essential for product quality control

• Certain key industry concerns, such as prevention of pesticide contamination and regulated use of growth hormones and antibiotics must be monitored
Policy document to guide future legislation on animal feeds

• With regards to QA the policy document declares that:

  • It intends to promote greater access to information for consumers

  • Animal nutrition in the rural areas will receive increased attention

  • It intends to facilitate easier access to commercial feedstuffs for emerging farmers in rural areas

  • Government plans to improve coordination between the registrar, agricultural research council and the South African Bureau of Standards
Policy document to guide future legislation on animal feeds

• With regards to QA the policy document declares that:

  • Product labeling requirements are to be reviewed to promote consumer safety and awareness

  • Animal feed manufacturers will have to adhere to a code of good practice in future

  • The DoA will regulate the licensing of feed manufacturers and the registration of additives
Conclusions

– The 21st century will witness a much closer relationship between the making of science and society, as opposed to the 20th century where society had declared itself satisfied to merely receive the products of science.

– SA feed industry is not isolated
  
  – Regulated partially by universally established control systems, irrespective if we export or not.
  – Responsibility to continuously address issues to achieve our goal to efficiently produce safe animal feed to contribute to the production of consumer friendly and safe food.
Conclusions

- SA feed industry needs to stay competitive
  - Create export opportunities
  - Counteract imports of cheaper, often-subsidised products

- In Africa society must however also realise that: “The man who has bread has many problems; the man who has no bread has only one”

- Need to also maintain a balance of producing cheaper, but still safe food for a population with great disparities in disposable income