Feed for Food
HACCP in the Animal Feed Industry
Feed quality

- Quality aspects:
  - Nutritional quality
  - Technical quality
  - Safety
  - Emotional quality
Examples of safety issues in animal feed industry:

- High aflatoxin in USA corn gluten feed (1989)
- Salmonellae in eggs and poultry meat (1988)
- Dioxin in Brazilian citrus pulp (1998)
- Dioxin in Belgian feed fat (1999)
- Nitrofenin in German cereals (2002)
- Dioxin in German bakery products (2003)
Triggers of Quality Assurance Animal Feed Industry

Feed/food safety crises results in:

- Stagnation sales/export
- Beating public confidence in food safety
- Financial damage
- Increasing safety requirements
GMP Animal Feed Assurance Scheme
Good Manufacturing/managing Practice
Aspects of Quality Policy animal Feed

Objectives

- To produce, deliver and feed animal feed which is safe for consumers (of all animal products), animals and environment
- In a trustworthy way for all stakeholders (chain partners, consumers, government–politics):
  * Demonstrable
  * Transparent
Aspects of Quality Policy
Main principles GMP scheme animal feed:
- Preventive
  › Pro-active approach: risk analysis → HACCP
  › Quality assurance/control from production feed materials till animal feeding
  › Part of the food chain
Corrective:
› Tracking and tracing
› Recall Produce
› Early warning system (EWS)
› External certification
Food safety depends on:

1. Basic knowledge in farming, industrial know-how, transport and storage.

2. Ethical behaviour

What to take care of in order to ensure food safety

a - Biological hazards: Bacterial infections (Salmonella, Shigella, Campylobacter, Aspergillus), virus infections (Hepatitis, Creuzfeld-Jacobs-Disease)

b - Parasites: Such as nematodes in herring and other relevant worms.

c - Chemical contaminants: Herbicides, pest control substances and other chemicals such as mercury in Japan.

d - Bacterial poisoning: Natural toxins can harm people even after the agent has been removed or killed. (Staphyloccoccine, botulism and other poisons)

e - Physical hazards: Ground Glass, metal or plastic fragments.

f - Radioactive contaminants: Radioactive fall-out of nuclear tests such as Brazil nuts with Strontium 90 due to fall-out of nuclear tests coming down in the rain forest of the Amazon region, or fall-out from the catastrophe of Tschernobyl.

g - Wrong industrial food processing and bad kitchen habits: High Temperature on backing and frying. Just to mention acrylamid in french fries, crisp bread and breakfast cereals.

h - Wrong nutritional habits: Under- or oversupply of vitamins and trace elements, insufficient supply of dietary fiber.
The HACCP concept had its origin in the USA and stands for "Hazard Analysis Critical Control Point".

Chronology of its development:

1958- Foundation of the NASA (National Aeronautics and Space Administration)

1959- Development of the HACCP concept to assure one hundred percent safety of food to be used in space.

1971- The HACCP system was published and documented in the USA.

1985- The National Academy of Science (NAS) recommended the use of the system. Worldwide the system became used and the FAO/WHO Codex Alimentarius (Food and Agriculture Organisation/World Health Organisation) cited the system in the Codex.

1993- The European regulation 93/43 EG from 14.7.93 provides the use of the system for the production of food.

The HACCP-concept

This HACCP concept has to be developed for all products of every factory. The five basic ideas of HACCP-concept are:

- Make a hazard analysis
- Determine the critical points (CPs) which might be of hazard in the production of the feed.
- Determine the CPs which may be CCPs being of high importance to the safety of the feed and which may be controlled safely using simple checks named "Controlling". For the controlling define the specifications of the product.
- Define a control system of the critical points, using tests which can be carried out during production in order to interfere in case of wrong production. "Monitoring". Introduce a documentation in order to record every happening. Define the corrections to be made in case of critical point being out of control.
- Define the way of verification to confirm that the HACCP-system works."Verification"
Timetable to install an HACCP System

1. The head of the enterprise names the QS Manager who is responsible for the installation of the HACCP System.

2. The QS Manager names the members of the team which shall work out the HACCP system.

3. The team should be composed of members of the production line, members of the bacteriological control, members of the quality control, members of the development. There should be persons with knowledge of feed bacteriology, food hygiene, feed technology. If there are not such persons in the factory, external aid should be taken in the phase of installing the system. The team determines what products can be handled together "Valid for.."

4. Come together of the team to make a "Description of the Products".
5. Come together of the team to make the "Flow Diagrams of the Products".

6. The team checks all documents to make corrections of possible errors.

7. The team marks all CPs on the flow diagrams. CPs are all points where a hazard for health of the consumer might occur.

8. The team identifies and marks all CCPs on the flow diagrams, trying to have a low number of critical control points.

CCP is a Critical Point where the hazard can be avoided, eliminated or reduced to an acceptable level.

How to identify a CCP?
9. The team determines the tests to be made at the CCPs (temperature, pH, acidity, filter, metal detector etc. The team marks the intervals between these tests.

10. The team determines the corrections to be made in case of fail production. The team determines who is responsible to execute the corrections.

11. The team determines the methods used to control the CPs.

12. The QS Manager verifies if the system works or not and if the internal audits are made in time HACCP is a living system. After installing the system it should be rechecked periodic. The work on the basic documents will never end.
HACCP and ISO

- HACCP may be integrated in the ISO 9000 Quality Assurance System
- The ISO 9000 System controls the characteristics of quality of the production covering all aspects of quality.
- With hazard every risk of the health of the consumer are meant. Excluded are all events which are not related to health. This is the difference of the Quality Management of ISO 9.000 which covers every events of quality.
- **Critical Point**. It is every point in the production of Food where risks of the health of the consumer can be present.
A Critical Control Point ("CCP") is a point in the production line where a risk of hygiene may be put under control or eliminated.

With appropriate measures at that point the risk can be:

1. avoided
2. eliminated
3. or reduced to an acceptable level

Examples of critical control Points (CCPs) are:
- Income of raw materials
- Storage and cooling
- Recipes, handling and processing
- Defrost, heating, warm hold phase and cooling
- Distribution of feed
- Correct separation between clean and unclean sectors
- Cleaning and disinfection
- Hygiene of the surroundings and hygiene of the stuff
A Quality Management system can integrate the rules of Good Manufacturing Practice (GMP), the HACCP and the Good Laboratory Practice (GLP).