

**GMP+**

## HACCP in the animal feed industry



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## Abstract

This brochure gives a brief presentation of the quality programme which applies for the Dutch animal feed industry. The goal of this programme is to produce and supply animal feeds which are safe for consumers of animal products, for the animals and for the environment; in a way which engenders confidence in all stakeholders - the partners in the supply chain, consumers and legislators - in other words demonstrably and transparently. An important part of this programme is the GMP standard for animal feed, which was set up in 1992. This GMP standard sets out the requirements for the quality system (comparable with ISO 9002) as well as a number of additional generic control measures for the production of, trade in and transport of animal feed materials, focusing on additives, undesirable substances and microbiological aspects.

The recent safety crises relating to feed and food (BSE, dioxin scares)

provided a very strong reason for enhancing the quality programme. This has resulted in (i) the integration of HACCP into the GMP standard; and (ii) upstream extension of quality assurance to all suppliers of feed ingredients. The quality system used in the food processing industry has thus effectively been adopted in the animal feed industry. This underlines the fact that animal feed is part of the food chain, a fact expressed in the slogan 'Feed for Food'.

The main points of the programme are:

- Food safety has a high priority worldwide.
- The animal feed industry, including ingredient suppliers, is part of the food chain and is responsible for the safety of its products.
- Demonstrable and transparent quality assurance constitutes a 'licence to produce'.
- HACCP is a proactive approach which links the feed chain to the food chain.
- Quality control of raw materials is a mutual concern for suppliers and the animal feed industry.
- Trade and industry are assuming their responsibility for product safety.

## Feed quality

The animal feed industry is an important supplier for stock farmers:



in intensive livestock farming, the share of feed in total production costs is fairly high, ranging from 40-60%. Accordingly, the price and quality of feeds are very important.

But what is feed quality? The answer encompasses the following aspects:

- Nutritional quality: this refers to the nutritional value of the product, expressed as available energy, amino acids and essential constituents such as vitamins, trace elements, etc., all of which are determining factors for animal performance and consequently essential to the profitability of stock farming.
- Technical quality: this refers to the characteristics of the feed, such as the size and hardness of pellets, fineness of crumbs, flavour, etc.
- Safety for animals, the environment (related to certain excretory components in manure) and consumers of animal products. Safety refers to the absence from the products of

unacceptable levels of undesirable substances and of disease-causing germs which could cause human health problems.

- Emotional quality: this is connected with ethics and ethology. An example might be feed for organic farming that does not contain any ingredients of animal origin nor any prophylactic agents, artificial colourings, flavouring agents, etc.

Nutritional value is very important for the economic value of feeds and the profitability of livestock farming. However, product liability considerations mean that enhanced safety is also an essential condition for the continuity of feed suppliers and livestock farmers.

### The importance of quality assurance

A number of food safety crises in the recent past have made it clear that

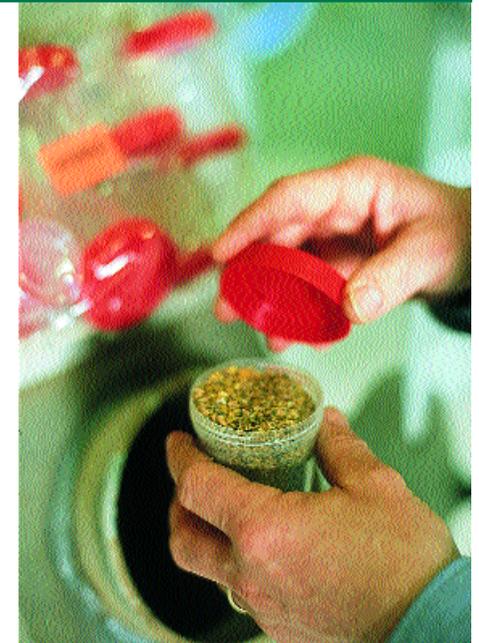


animal feed has to be considered as a potential hazard to public health, and one which can lead to declining confidence in the safety of food of animal origin. However, it also has to be recognised that feed safety is not the only element that determines the safety of food of animal origin, but that the use of other products, such as drugs and growth promoters (hormones and beta-agonists), also has an impact.

Although nutritional and emotional quality are important points for a common policy in the industry, the main concern is feed safety as part of food safety.

It is clear that control of product safety is a must for gaining and maintaining public confidence in food safety and of avoiding disruption to sales of food products. The quality of milk, meat and eggs is even more important for Dutch agriculture, because about 60% of these products are exported. Continuity of exports demands guaranteed product safety. Failure to meet this requirement will lead to:

- stagnation of sales
- reduced consumer confidence in food safety
- negative financial consequences for many companies
- an increasing need for safety standards in legislation and in the retail sector.



### Total quality assurance and control systems

The main question for the animal feed industry is how to contribute to controlling feed safety and avoid being put in the dock. It is clear that the animal feed industry, including feed ingredient suppliers, is an important component in the food production chain and bears considerable responsibility for product safety.

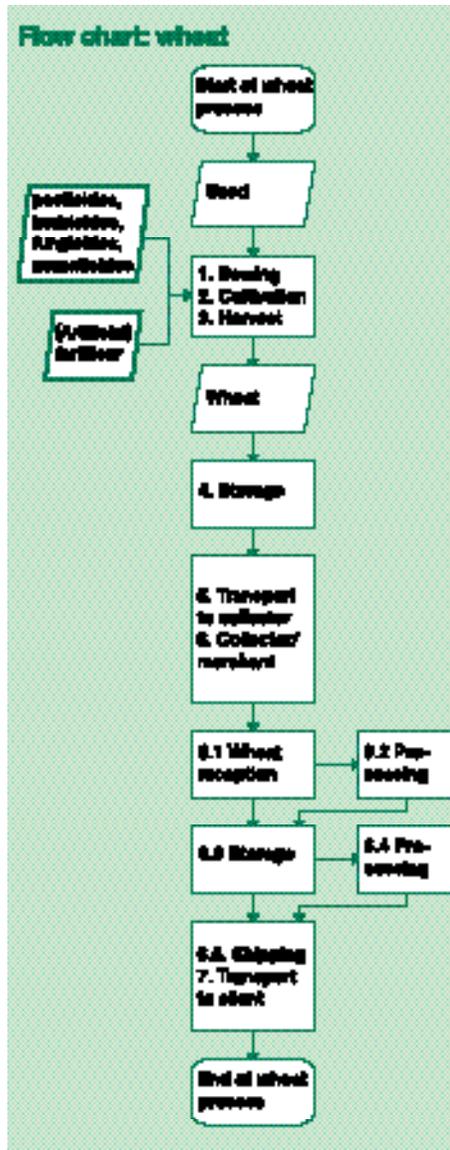
The retail sector in particular wants product safety to be demonstrably safeguarded throughout the entire production chain, including in the animal feed industry. For this reason, the pig and poultry industries began implementing Integral Chain Quality Control programmes at the beginning

of the 1990s, focusing on controlling use of drugs, animal living conditions, etc., in stock farming, as well as on controlling animal feed quality. Instead of expensive end-product inspections, attention turned to controlling the various critical steps in the production process. Since that time similar integral chain quality control programmes have also been developed for the dairy, beef and veal farming industries.

### GMP: Good Manufacturing / Managing Practice

A key point for attention in the quality control programmes for animal husbandry mentioned above is the safety of animal feed. To meet the animal feed quality control requirements, the Product Board Animal Feed in the Netherlands developed the GMP standard for animal feed in 1992, a quality management system for the animal feed industry. This GMP standard is one of the main elements in the animal feed quality programme. Livestock farmers participating in the quality control programmes referred to earlier may purchase feeds only from GMP-certified feed suppliers.

More than 95% of Dutch suppliers of mixed and simple feeds to livestock farmers have already attained GMP-certification, and more and more German and Belgian feed suppliers are operating in accordance with it.



### Ongoing improvement and enhancement

The main objectives of the Dutch animal feed quality programme are:

- to produce and supply animal feeds which are safe for consumers of animal products, for the animals and for the environment;
- to do this in a way that will engender confidence in all stakeholders – the partners in the supply chain, consumers and legislators – in other words demonstrably and transparently.

These objectives are clear, but their content is evaluated as time goes by. In the past decade this system has been adapted and extended on the basis of practical experience and ongoing insights. Mad cow disease (BSE), dioxin contamination of Brazilian citrus pulp (1998) and the Belgian dioxin affair (1999) were particularly important impulses prompting drastic changes.

### Enhancement of the GMP standard for animal feed

The GMP standard for animal feed as it stood was mainly focused on known risk factors such as pesticides, heavy metals, aflatoxin and salmonella. The quality assurance system for animal feed appeared to be insufficiently geared to avoiding unforeseen sources of contamination, and was thus largely reactive in nature.

For this reason, in June 1999 the Product Board Animal Feed decided to enhance the GMP quality assurance system for animal feed significantly by adopting:

- a proactive approach involving risk analysis in the entire feed production chain with HACCP as part of the quality system;
- upstream extension of the quality assurance system to suppliers of feed ingredients;
- development of an early warning system (EWS) for non-recurring unacceptable contamination occurring despite all precautionary and control measures.

Essential elements in this approach are the systematic working method and the advance actions. These may also help avoid emotional reactions and uncontrolled decisions.

### Principles

Important principles for the successful application of the system are as follows:

- Every business in the animal feed sector, including suppliers of ingredients, has to be aware that it is supplying goods for the human food chain and is responsible for the safety of the products it supplies.
- Every business is able to demonstrate that it safeguards its products by means of a (certified) quality system.
- Every business is required to report imperfections in product safety (early warning), so that

problems can be tackled at an early stage.

### The GMP+ standard

By using the HACCP approach, the Dutch animal feed sector has opted for a quality assurance system which is also applied in the European food industry. In combination with GMP and upstream quality assurance for feed ingredients, it is even more fully developed, and is therefore called GMP+. This is not just a quality management system, but also contains process management and product control elements. In addition, the risk analytical approach in GMP+ is in accordance with the principles as set out in the White Paper on Food Safety of the European Commission (January 2000).



This emphasises that the animal feed industry and the ingredient



suppliers are part of the food chain. To underline this, the slogan 'Feed for Food' was introduced by the product board.

### Elements of the quality policy

The renewed quality policy for the animal feed industry is based on an approach that involves risk analysis. This consists of three components: risk assessment, risk management and risk communication.

#### Risk assessment

Risk assessment is carried out by experts on the basis of scientific recommendations and the analysis of information. It involves hazard identification and characterisation, exposure assessment and risk characterisation. In March 2000, the Product Board Animal Feed published an HACCP guideline for the animal feed industry, based on

the HACCP document from Codex Alimentarius (WHO), which was developed by TNO Nutrition and Food Research Institute.

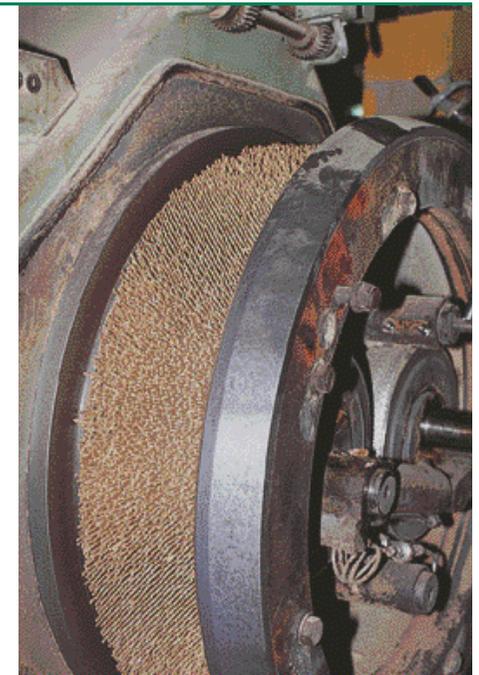
Risk assessment is carried out on two levels: at chain level (generic) and at individual company level (specific). The generic risk analyses are performed on each feed ingredient. The results of these analyses are stored in a database (from mid-2001) which will be updated regularly on the basis of practical experiences and ongoing insights.

The generic risk analyses serve three goals. Firstly, they help companies to carry out their own specific analyses at company level. Secondly, they serve as a reference for the inspectorates. Thirdly, they make the level of risk analysis transparent for the other stakeholders in the animal production chain.

How is a risk analysis carried out?

The steps are as follows:

- Definition of the product.
- Definition of all steps in the production process and identification of all critical steps that may occur during a hazardous situation, using a process diagram.
- Identification of possible hazards at each critical step and classification of the hazard as chemical, physical or microbiological.



- Determination of the risk level, which is the result of the probability that a hazard will manifest itself and the severity of the consequences if it does.
- Determination of the relevant risks and critical points in the production process (risk evaluation).

Four risk levels can be determined with the risk assessment model. In the event of risk level 1, no measures are necessary. In the event of risk level 2, periodic measures – often activities needing to be performed just once – have to be carried out. Risk level 3 requires general control measures, such as hygiene programmes, maintenance and calibration, purchasing procedures,

Very helpful for the documentation of the risk assessment process is the following table, which contains each step mentioned hereafter.

Process									
no.	Process step	Hazard description	Ctrl.	Prob.	Occ.	Risk	Type of measure	Preventive	Monitoring

Risk assessment model			
Severity	Probability of occurrence (in feed product; at consumption)		
	Small	Medium	Great
Great	4	4	4
Medium	3	3	4
Small	1	2	3

etc. These measures are often called Point of Attention (POA) or GMP measures. Most of them are already included in the GMP standard for animal feed. In the event of risk level 4, specific control measures are necessary geared to each particular situation.

All GMP-certified suppliers of compound feedstuffs, straight feeding stuffs and recycled feed fats are required to perform this type of risk assessment as an integral part of their GMP-quality system.

### Risk management

Risk assessment forms the basis for determining control measures. Risk assessment is a component of risk management, resulting in:

- determination of control measures for eliminating or reducing these

risks and controlling them at an acceptable level, including tracking and tracing of products;

- determination of product standards



and action values for undesirable contaminants in feeds;

- implementation of a measuring strategy (monitoring and verification) for checking whether or not the control measures are effective.

In an HACCP approach, a well-considered and reasonable balance has to be found between preventive measures and monitoring of feed ingredients for the presence of risks. Nevertheless, where there are doubts about the ability to get a grip on the risks, precautionary measures such as avoiding use of a particular product must be taken.

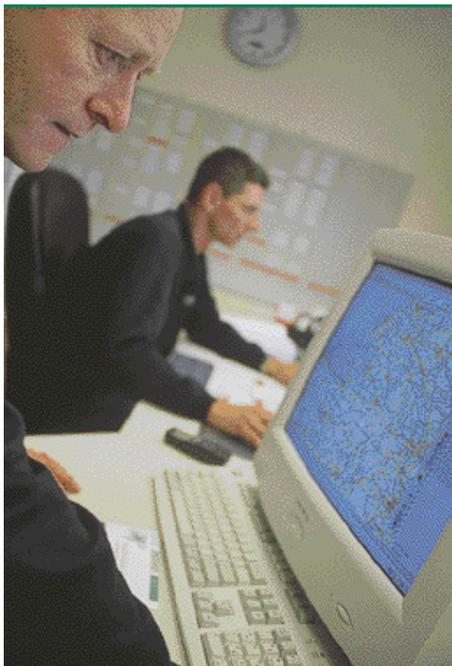
Several control measures and product standards have already been incorporated in legislation, but they are fairly fragmented and do not go far enough. To address this shortcoming, the GMP+ standard for Animal Feed offers a coherent framework. The GMP+ standard currently comprises the following elements:

- General requirements for a company's quality system, comparable with and based on the ISO 9002 standard, in order to render quality assurance demonstrable.
- Criteria for risk assessment based on HACCP principles.
- Several additional sub-codes involving generic control measures in the production process related to the use of additives, drugs,



undesirable substances and hygiene (salmonella). These additional control measures have been stipulated for the production and supply of compound feedstuffs, premixes, straight feeding stuffs and feed ingredients, feed fats (in addition to those for feed ingredients), storage and transshipment of feeds, and for transport.

- Minimum requirements for in-company inspections, such as quality assurance for laboratory analyses, sampling frequency, etc.
- A set of product standards, consisting of European Union legal standards, additional national legal standards, and several supra-legal standards agreed with the partners in the chain.



A guideline for tracking and tracing is being developed to standardise the level of accuracy in the forward tracking of supplied products and to enable received goods to be traced back to their point of origin.

The aim is also to extend the quality control of animal feeds at farm level. GMP-requirements for handling feed materials on pig and dairy farms are therefore under development.

Since 1 October 2000, GMP-certified suppliers of compound and straight feedstuffs have been obliged to purchase feed ingredients only from suppliers able to demonstrably guarantee product safety. All domestic feed ingredient suppliers must have a

certified quality system that complies with GMP requirements, based on GMP certification, or equivalent ISO 9002 or HACCP certification which verifies that the supplier meets the relevant GMP requirements.

The aim for the future is a situation where all foreign suppliers also have a certified quality system; however, this cannot be achieved in the short term for all sources, and for this reason a modified standard ('Standard Quality Control of Feed Ingredients for Animal Feed') has been established for the time being for foreign suppliers of feed ingredients; this must be implemented by 1 July 2001 at the latest.

This standard is also based on the tenet of demonstrable risk control based on HACCP principles. Where a foreign supplier does not have a certified quality system, the buyer must obtain a level of comparable certainty that safety assurance levels meet the following three conditions:

- The supplier must submit a document to the buyer containing a specified minimum amount of information demonstrating how the quality of the products is safeguarded in accordance with the main principles of HACCP.
- The foreign feed ingredient supplier must contractually agree to submit an updated document to the GMP-certified purchaser if modifications



occur, and to operate fully in accordance with the descriptions in the submitted document.

- The feed ingredient supplier concerned must agree to a regular verification inspection by an independent, accredited inspection body (EN 45011 or EN 45012) which is accepted by the Product Board Animal Feed.

Experience has shown that a large number of foreign feed ingredient suppliers in many countries have already implemented a quality system akin to ISO 9002 or HACCP, or are in the process of developing such a system. In these cases, both parties' quality systems – the supplier's and purchaser's – can be linked up.

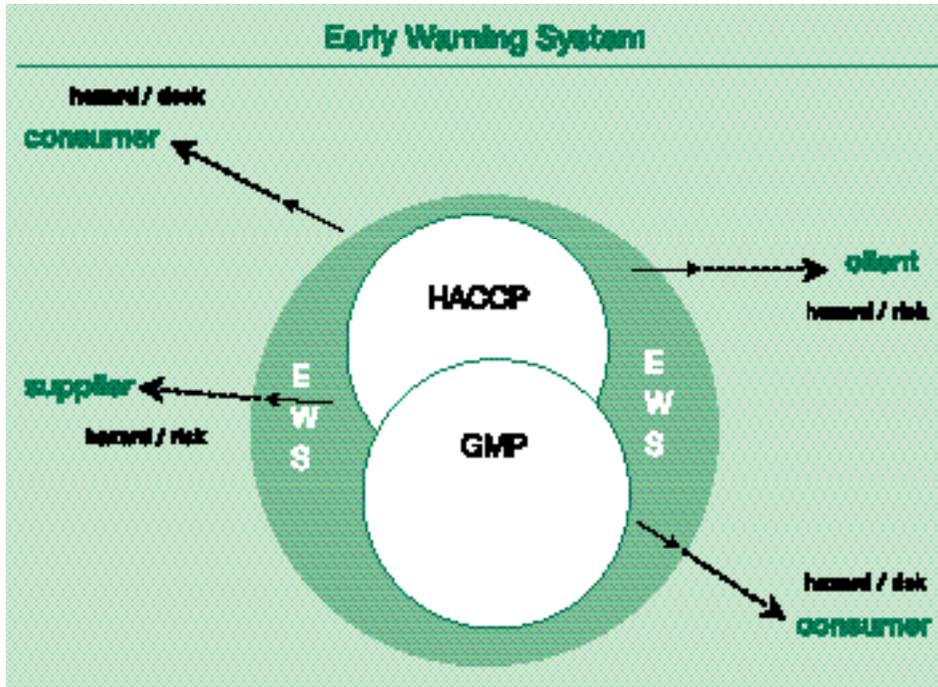
### Risk communication

The third part of the quality programme is communication of the results and progress of the quality programme. This entails communication with

the stakeholders in the animal feed industry and in the related animal food production chain, including the retail sector, and with community organisations, government authorities and Parliament.

Transparency and accountability are very important goals. The product board uses several means of communication, especially publications, databases and the Internet ([www.pdv.nl](http://www.pdv.nl)), in addition to a quarterly newsletter.





## Early Warning System

An early warning system (EWS) is intended to be a safety net, as a supplement to quality management systems like GMP, ISO 9002 and HACCP. The goal is to identify, communicate and eliminate possible or potential hazards which may occur despite all preventive measures taken.

No quality system is able to avoid totally all problems which may be caused by incidental factors (human error, natural events) or criminal acts. A proactive approach must be adopted to prevent potential hazards

manifesting themselves. Key elements in such a system include speed, care, confidentiality, accountability and responsibility.

## Product Board Animal Feed

The GMP-regulations for the animal feed sector have been developed by the Product Board Animal Feed. The Product Board Animal Feed is a regulatory authority under public law. It also serves as a platform for all the links in the animal feed chain. The Board represents all companies which are active in the production of and/or trade in animal feed ingredients and the production of animal feeds.

For more information:

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