GMP+ Feed Safety Assurance scheme

Tracking & Tracing Compound Feed

GMP+ D4.2

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4.2

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Feed for Food

INDEX

1 Introduction

1.1 General

The GMP+ Feed Safety Assurance scheme (GMP+ FSA) has been developed since 1992. It was managed from 1992 up until 2009 by the Product Board Animal Feed, The Hague, The Netherlands. Since 2010, this scheme is managed by GMP+ International.

It is a certification cheme for assuring feed safety in all the links in the feed chain. It is also an international scheme, applicable worldwide.

The establishment and development of the scheme was primarily the result of demand from the subsequent links in the animal production chain for better control of feed safety. Another contributory factor was the damage caused by more and less serious contamination incidents.

In the initial phase the demand arose for better differentiation in an increasingly saturated European sales market for animal products. Since 1999, feed & food safety has been a top issue internationally both politically and commercially, because of serious incidents in the feed sector. Because of this, demonstrable assurance of feed safety has become a license to sale.

The basic principle of the GMP+ FSA scheme is that the feed chain is part of the food production chain. Proper assurance of feed safety worldwide is a high priority. Companies must live up to their responsibilities and respond properly and convincingly to the needs of food production chain. The GMP+ Feed Safety Assurance scheme is an aid to realise this.

1.2 Structure of the GMP+ Feed Safety Assurance scheme

The documents within the GMP+ FSA scheme are subdivided into a number of series. A description follows of these:

A General (framework) documents	These documents contain the requirements for participation in the certification scheme for companies and certification bodies (framework regulation, the use of logo's, etc.). This series also includes a general list of definitions and abbreviations.

B Normative documents.	These documents contain the international standards and additional country notes for use by companies with respect to the various feed products and production phases including cultivation and industrial production, treatment and processing, collection, trade, means of transport, storage and transhipment.
C Certification requirements	These documents contain the Rules of Certification including those for the approval of certification bodies and auditors, the frequency of audits, minimum audit time, assessment criteria, checklists, etc. There is also an explanation of how the supervision by certification bodies is implemented and of how GMP+ International supervises the certification process.
D Interpretations and accompanying texts	In addition to the above-mentioned normative documents, there are also supporting documents in the D series including a list of frequently-asked questions, manuals and guidances with additional information.

Document	**Code**	**Name**
	GMP+ Dx.x	GMP+ D4.2 Tracking & Tracing Compound Feed

All these documents are available through the website of GMP+ International (www.gmpplus.org).

The document in the present case is referred to as standard GMP+ D4.2 *Tracking & Tracing Compound Feed* and is part of the GMP+ FSA scheme. It is not a normative document, but a project in coorperation with the Product Board Animal Feed . In the document you can find the original texts of the report. The information of this project can be used as a guidance for the implementation of the GMP+ FSA norms.

2 FOREWORD

On 16 June 1999, the Product Board Animal Feed drew up the 'Plan for the Improvement of Quality Assurance in the Animal Feed Sector'. The focuses of the plan were primarily (i) the incorporation of the HACCP principle into risk assessment and control, (ii) a better guarantee for the whole feed chain (incl. raw materials suppliers) and (iii) the development of an early warning system.

In drawing up the HACCP manual for the animal feed sector in 2000, the need became apparent for further detailing and standardisation of tracking & tracing in the animal feed sector.

An animal feed sector tracking & tracing project started in mid-2001. The aim of this project was the development of a system (both administrative and physical) in which the most accurate and rapid traceability of irregularities would be possible in batches of feed and fodder. The project consisted of two sub-projects, namely: compound feed and animal feed raw materials. *This report relates to compound feed.*

The DLV Consultancy Group carried out this project for the product board. A working group of experts from the compound feed industry supervised the implementation of the project. We should like first to express our gratitude to DLV for the approach, method of working and for the result which is immediately applicable in practice. We should also like to express our appreciation to the members of the work group for their input and expertise which has made an important contribution to the quality and practical usefulness of the report which has been produced.

This report on tracking & tracing in the compound feed industry, is included in this publication in the Quality Series. The result of the study of animal feed raw materials tracking & tracing (from the loading port) is included in a separate publication.

Based on the result of this study and the advice of the College of Experts of the Animal Feed Sector, the Board decided in June 2002 to include the guidelines for tracking & tracing in the GMP code. In due time the final guidelines will be communicated to the sector. The ambition is for the companies to comply by 31 December 2003 at the latest with these final guidelines.

In anticipation of the modification of the GMP code, the Board has also decided to inform the companies of the above-mentioned report partly because of the fact that the report describes a model T&T system. This allows the companies to take advantage of the report. Every company which undertakes one or more activities for which there are guidelines on traceability in this report or in the report on animal feed raw materials may deduce which records are desirable for their company.

A summary report which can be used by companies abroad will be translated into English and German.

FINAL REPORT

TRACKING & TRACING COMPOUND FEED

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3 Introduction

3.1 Reason for the study

The traceability of products is becoming increasingly important. Safe feed for animals is an absolute requirement for the food chain. In the animal sector traceability of products is important in being able to trace back possible sources of contamination. In the Netherlands requirements are increasingly being set in this regard on the traceability of animal feeds and animal feed raw materials. These requirements are set both by private parties (feed industry, retail) and the government (both Dutch and EU legislation in the field of food safety and product liability[1]). The risks in the animal feed chain can be controlled better using HACCP and it is possible to recognise and improve the critical points in the chain. If there should nevertheless be a problem in one of the links in the animal feed chain then the government and the consumer demand traceability of the product. Not only the source but also the consequence of a particular problem must be traceable.

In view of the importance of traceability the animal feed sector has a need for Tracking & Tracing guidelines in the animal feed production chain. The Product Board Animal Feed has asked DLV Consultancy Group to carry out a study for the drawing up of guidelines for the tracking & tracing of animal feed. In parallel to the study in the Netherlands, a study has been made in Belgium of traceability in the animal feed sector. This study was made by the Gent College for the BEMEFA. The Belgian and Dutch studies were done in more or less the same way and with regular discussion between the two project leaders so that the results of both studies are quite comparable. The two projects were reported separately.

The results of the Dutch study are described in two report sections. The first section (this report) describes the results of the study “Tracking & Tracing Compound Feed” and the second report section gives the results of the study “Tracking & Tracing Animal Feed Raw Materials” (separate report). Chapter 2 describes the results of the practical inventory of the compound feed sector. Chapter 3 then describes the guidelines for tracking & tracing animal feed and provides the compound feed companies with a model system at the basic level. Finally, chapter 4 contains a number of recommendations.

3.2 Project perspective

The central issue (see section 1.3) in this project relates to the drawing up of guidelines for tracking & tracing in the Dutch animal feed sector. Before addressing the objective of

[1] This legislation is laid down in, among other things, the new European General Food Law which will become effective in 2004, the Dutch Food Safety Act, legislation for GMOs under Act numbers 258/97 (Novel Foods decree), 90/220/EEC (deliberate introduction of GMOs, directive implemented in October 1991, modified on 12 April 2000), 1139/98/EC (model for labelling in Europe), decree 49/2000 (1% threshold value for labelling) and 50/2000 (labelling of MO additives and ingredients) and finally /18/EC (traceability and labelling of GMOs and traceability of food and animal feeds derived from GMOs, submitted on 25 July 2001)

and the approach to the object of the study in the following sections, a short description of the term Tracking & Tracing and the project perspective follow[2].

3.2.1 Tracing & Tracking

Tracking & Tracing provides insight into the location of the goods at a particular moment . The Tracking & Tracing system creates a set of historical data by way of a recorded identification so that it is possible to follow raw materials, semi-manufactured and end products.

Tracking is the determination of the location of a given batch at a period of time to be determined.
Tracing is the determination of the history of raw materials, semi-manufactured and end products during their passage through the chain. The term Tracing can be further subdivided into upstream tracing and downstream tracing.

Upstream tracing:
Upstream tracing is the determination of the history of the specific product back from end product via semi-manufactured product to raw materials. This process is used to trace the source of a problem following a complaint from the market or deviations found during the inspection of semi-manufactured products or end products.

Downstream tracing:
Downstream tracing is the determination of the history of the product from the raw materials via the semi-manufactured products to end products. This process is used in the event of late signalling of problems in raw materials or semi-manufactured products, to determine in which batches of end products the problems may occur.

[2] Appendix 1 contains a list of definitions of much-used terms in this report.

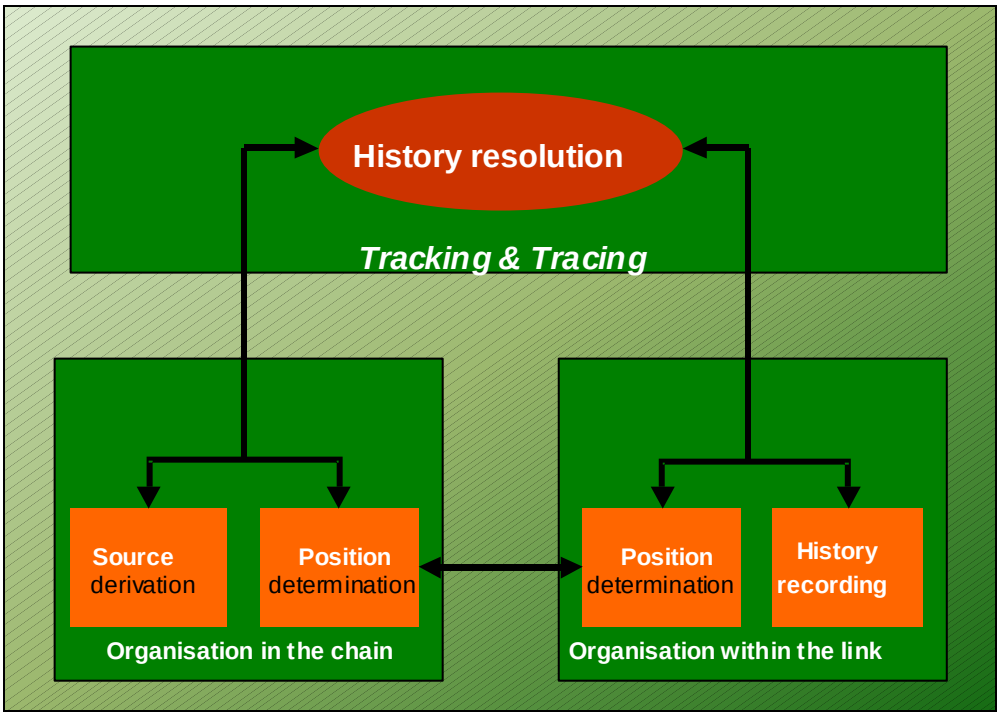


Figure 1: The essence of Tracking & Tracing

The essence of Tracking & Tracing is shown in figure 1. As can be seen from this figure, Tracking & Tracing is active on two levels: at chain level (left side of the figure) and at link level (right side of the figure). At link level a system will have to make clear where products are located (location determination) and what has happened to them (recording of information). This can be done through a system at company level. At chain level a system will also have to make the location of products clear and will have to discover what has happened to a product in the chain (source derivation). The focus of this study is Tracking & Tracing at link level.

3.2.2 The project perspective

Tracking & Tracing is important in the animal feed sector for all the participating parties in the animal feed production chain (see figure 2). This project is however aimed at the two key links in the animal feed chain, namely the raw materials suppliers (raw materials imports and raw materials trading) and the compound feed industry. In the figure these are the two links shown in the box.

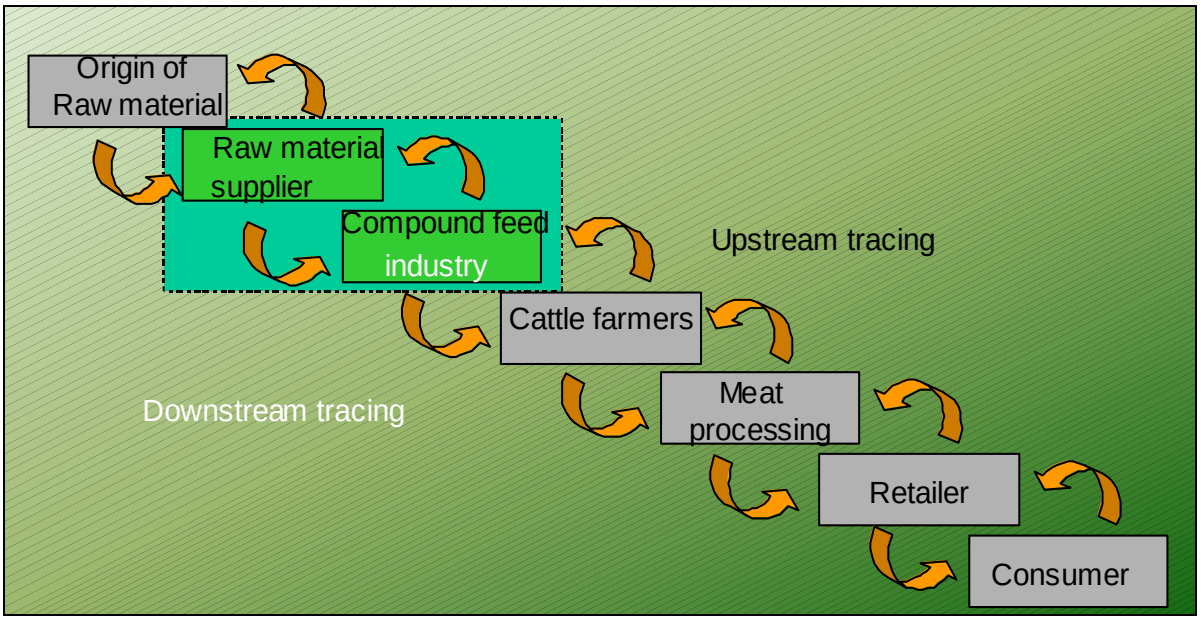


Figure 2: Animal feed chain

The *raw materials suppliers link* relates to those companies which act as shipping agent or as importer in the purchase and sale of animal feed raw materials both inside and outside the European Union. The major activities of the raw materials suppliers are the purchase and sale of animal feed raw materials such as Soya lumps, tapioca, grain, maize, etc. Tracking & Tracing in this link relates to the purchase of the product, transportation (shipping), transhipment and the sale of the product to the compound feed industry.

The *compound feed industry link* relates to those companies which are active in the production and sale of compound feed. The production of compound feed begins with the purchase of animal feed raw materials which are then processed through processes such as mixing, grinding and pressing into compound feeds for various animal groups. Tracking & Tracing in this link relates to the purchase of the raw materials, the production and storage process and the sale of the feed to the customers (cattle farmers).

The processes in the two links mentioned above differ greatly so that guidelines for tracking & tracing will not be identical. In the approach to the project (see section 1.4) the two links are therefore treated separately. The results of the study are reported separately for the two links namely report section I “Tracking & Tracing Compound Feed” and report section II “Tracking & Tracing Animal Feed Raw Materials”.

3.3 Project objective

The following project objectives were formulated in the project plan:

- *The setting up of an analysis model for tracking & tracing animal feed in which the basic and higher norms for an animal feed tracking & tracing system are determined.*

- *The making of an inventory of existing tracking & tracing systems in the animal feed sector on the basis of the animal feed tracking & tracing analysis model at 9 animal feed companies.*

- *The drawing up of guidelines for tracking & tracing animal feed. These guidelines will be translated to, for example, tracking & tracing systems for two links in the animal feed production chain, namely compound feed production and raw materials suppliers (including importers and shipping agents).*

3.4 Structure of the study

The project has been divided into four phases to achieve the above-mentioned objectives and these are discussed briefly below:
1. Drawing up an animal feed tracking & tracing analysis model;
2. An inventory of the practical situation and analysis;
3. Description of guidelines and model T&T systems;
4. Communication of the results.

Phase 1. Drawing up an animal feed tracking & tracing analysis model

An analysis model is necessary for the inventory of the tracking & tracing systems. Together with the Work Group Tracking & Tracing a process description was first drawn up for compound feed production. This process description is shown in figure 3 on the main processes of compound feed production and in appendix II there is a more extensive representation of the detailed sub-processes.

The processes mentioned in figure 3 have been used as the basis for drawing up the traceability model for animal feed. This model was drawn up in consultation with the Work Group Tracking & Tracing. The traceability model is shown in appendix IV. The model describes the so-called basic level and the so-called higher level with which tracking & tracing in the compound feed sector must comply. The basic level is the basis for all companies in the sector. The higher level goes further than the basic level and can be set by compound feed companies as a target.

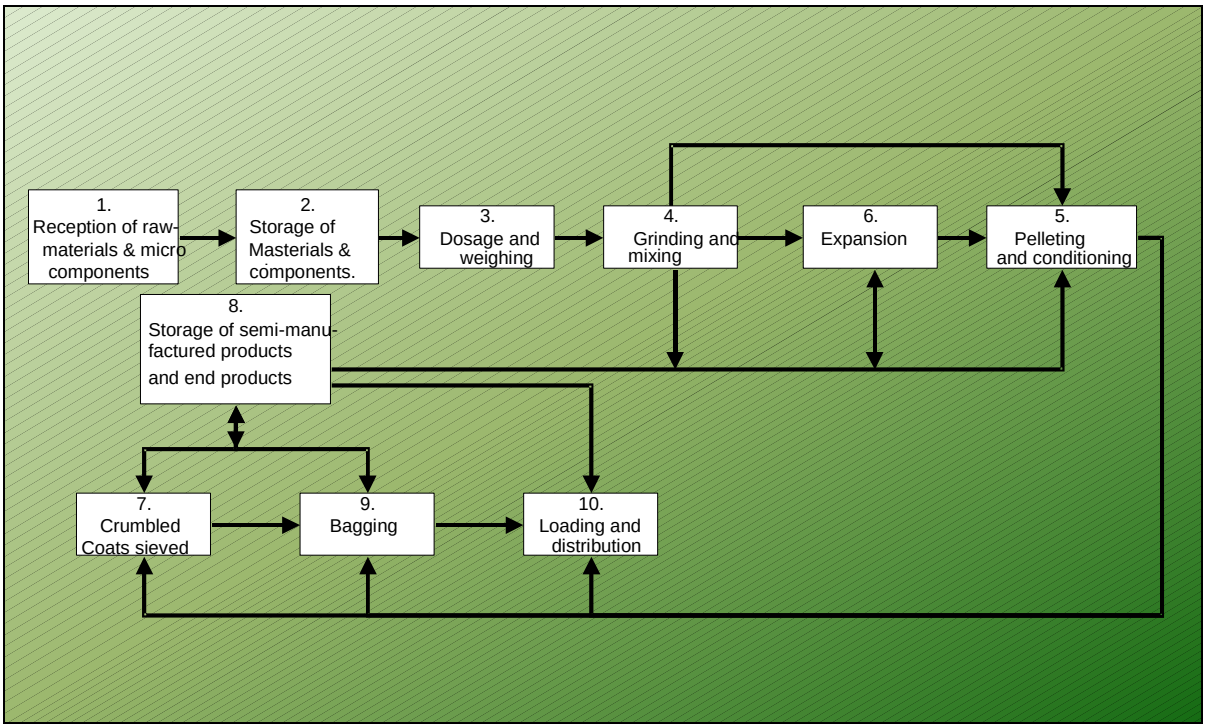


Figure 3: Main process diagram for compound feed production

Phase 2. Inventory and analysis

In the study the client selected a total of 10 locations for the practical inventory, namely compound feed production (7) and raw materials import and trading (3). The tracking & tracing system at these companies has now been examined in detail by way of an in-depth interview.

The traceability model from phase 1 has been translated into an extensive questionnaire which formed the basis for the practical inventory. The performance of the companies in the field of traceability was inventoried through the questionnaire. This performance was measured and analysed on the basis of the so-called ITI model.

This analysis model provides insight into the current strengths and weaknesses of the traceability systems of the participating companies. The ITI model comprises three elements, namely Information, Technique and Integration. Information relates to the available product and process information in the company. Technique handles the question of which technique will be used to make traceability possible. Integration addresses the harmonisation of the product and process information between links in the chain. The major criteria for the ITI model are shown in the following diagram (figure 4). A more extensive explanation of the ITI model is given in appendix III.

The performance of the companies in the field of traceability is expressed in a score. The score is recorded using the performance with respect to the criteria for the elements Infor-

mation and Integration. The score for a criterion is weighted in the total score for the company. The weight of a criterion depends on the importance of the criterion for the traceability system. Using questions on the various criteria in the model, the systems were assessed and points allocated. No score can be obtained for the element Technique. This element describes how the traceability system was implemented at the company. This may be by way of computerised systems but there may also be manual records.

The element Technique was included in talks with the companies but was not converted into a quantitative score. In achieving the objective of the traceability system, the technique used was not of primary importance. It may however be important as the quantity of data to be recorded and the speed of the information increases.

The score for performance with regard to traceability consists of a figure between 0 (minimum score) and 100 (maximum score). This means that the score of 100 forms a sound system for the traceability of compound feed (ideal situation) which is not achievable in the current circumstances. A score of 90 is the score for the higher level referred to earlier and a score of 70 is the score for the basic level referred to earlier.

The results of the practical inventory are described in detail in chapter 2.

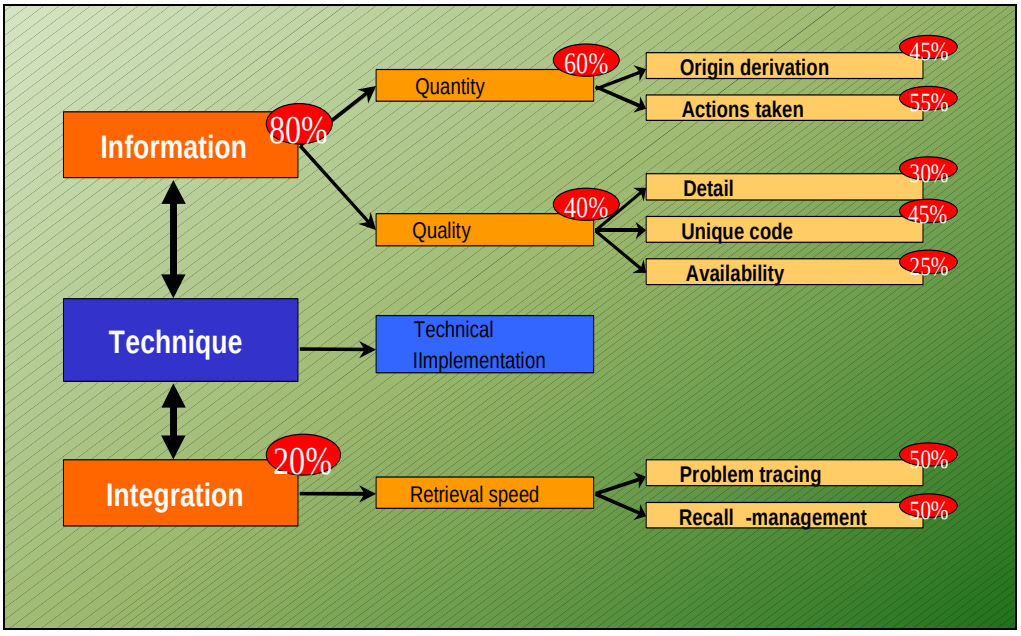


Figure 4: ITI model

Phase 3. Description of guidelines and model tracking & tracing systems

The final version of the guidelines for tracking & tracing in the animal feed sector is described in this phase. A model traceability system for compound feed companies is then shown in chapter 3. This model system provides ideas for other companies in the sector for implementing and organising tracking & tracing in their own companies. Companies in

the sector know on the basis of the model system how tracking & tracing may be organised in the company.

Phase 4. Communication of the results.

The results of the previous phases have now been discussed with the Work Group Tracking & Tracing Animal Feed by way of presentations. Finally, the results are described in this final report “Tracking & Tracing Compound Feed”. Further communication of the results will be coordinated by the Product Board Animal Feed.

4 Results of the practical inventory

4.1 Introduction

An inventory was made during the study of the status of traceability systems in the animal feed sector. This was done using a field study at seven compound feed production sites. These compound feed sites were selected by the Work Group Tracking & Tracing[3] of the Product Board Animal Feed. There were a number of larger and smaller locations. In addition, the companies differ considerably with respect to the degree of computerisation.

A limited number of companies was included in the project practical inventory of traceability systems. This means that the results of the inventory are only a reflection of the current status of traceability systems in the compound feed sector. The results are merely indicative and, because of the size of the random sample, have no statistical value.

4.2 Results of the field study

The results of the field study are described in this section. The results are shown as graphs in which the practical inventory scores at the compound feed production companies are shown. The results are then discussed in detail. The results are split by total performance with respect to traceability (§ 2.2) and by performance with respect to information (§ 2.3), integration (§ 2.4) and technique (§ 2.5). After each explanation of the results, the major items for improvement are mentioned separately. In the description of the model system in chapter 3, possible solutions are discussed for the items for improvement which were observed.

In order to be able to place the field study properly, a number of general details on the production locations in question are presented briefly. A total of 7 compound feed production locations were included in the practical inventory. The production capacity of these 7 sites varies from relatively very high to relatively low. The spread can be seen in figure 5.

[3] The composition of the Work Group Tracking & Tracing of the Product Board Animal Feed is shown on the title page of this report.

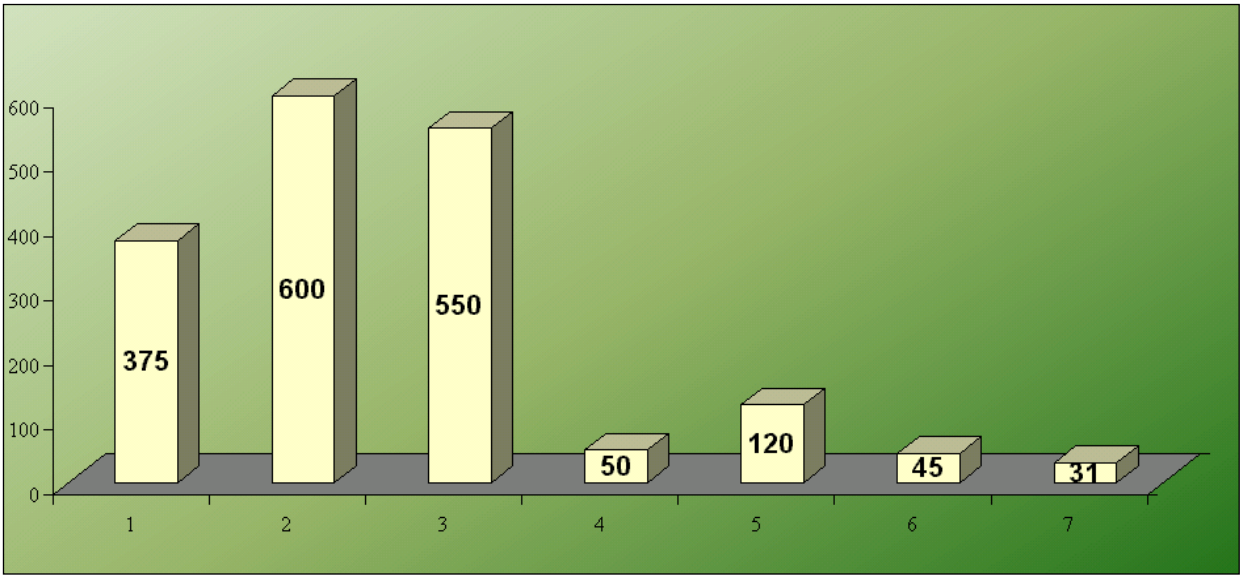


Figure 5: Production volume of the companies in tons per year

The 7 compound feed production locations produce animal feeds for different types of animal. A number of specialised graphs are included within the company and also some locations where feed for more than one type of animal is produced. The total production of the compound feed production locations involved may be spread across four categories of animal feed. These are shown in figure 6.

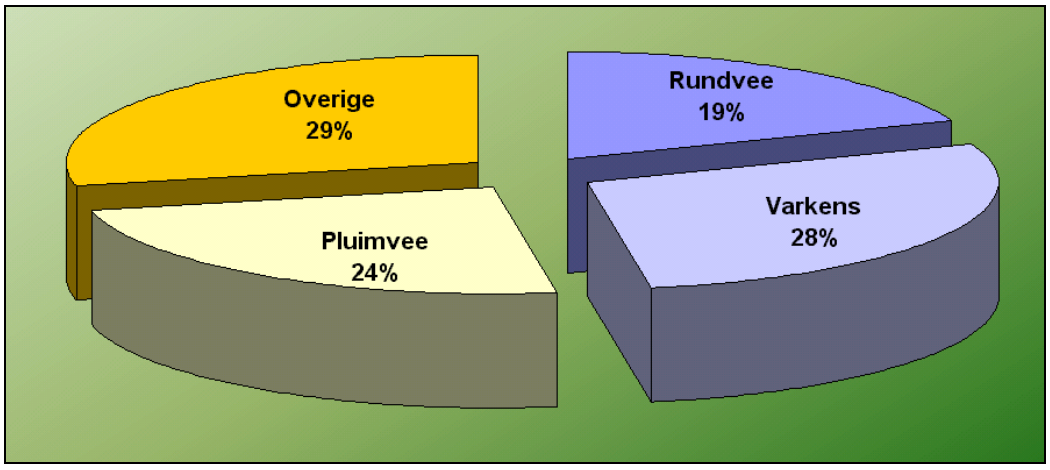


Figure 6: Categories of feeds in % of the production

Nearly all the participating locations produce feeds for both bulk distribution and for distribution in bags. A number of companies also distribute in big bags. The total spread of bulk production and bag production is shown in figure 7.

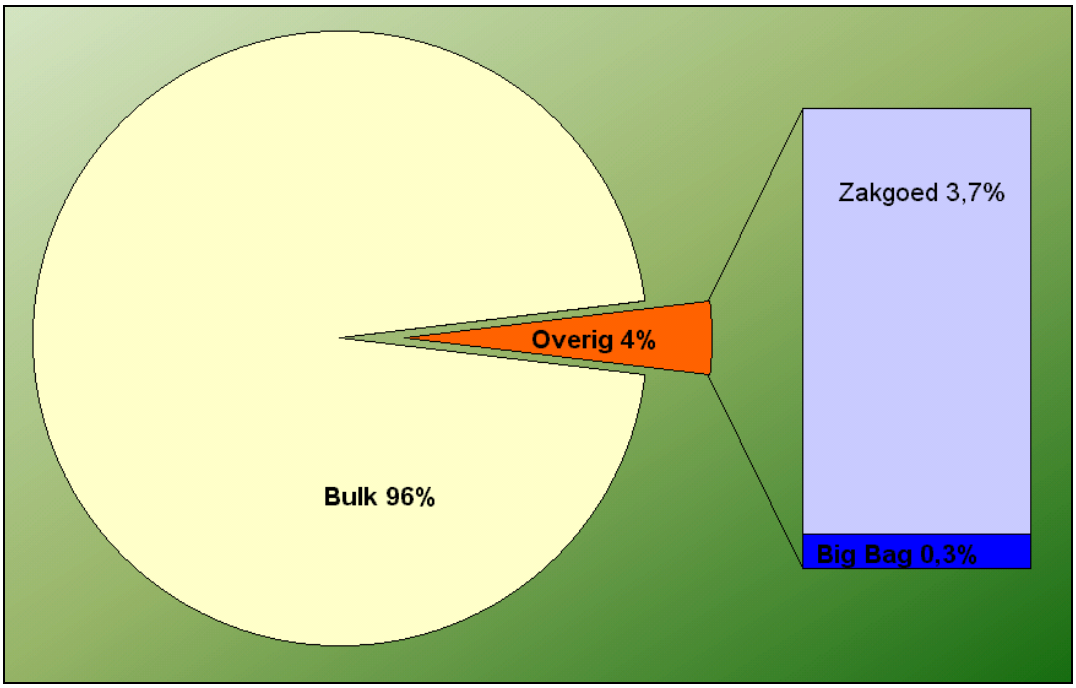


Figure 7: Spread of bulk, bag and big-bag distribution

A number of process steps in the production of feed were examined at the production locations. The process steps may be different at the various production locations. Figure 8 provides a summary of at how many production locations certain process steps take place.

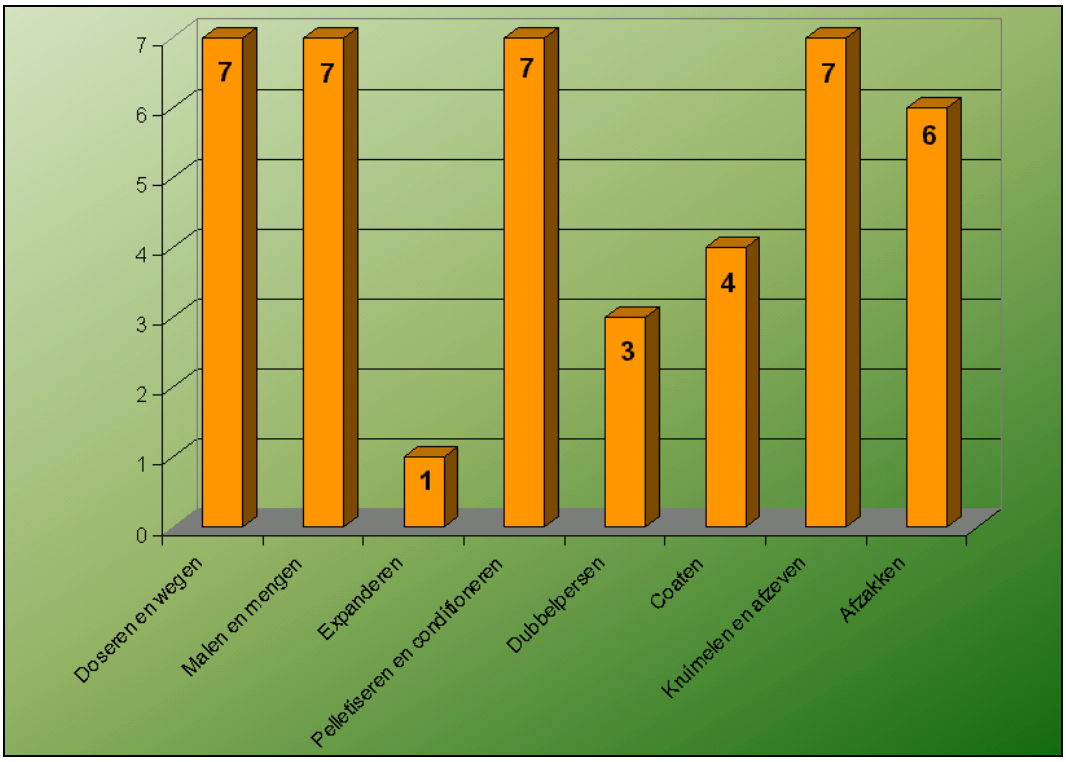


Figure 8: Number of companies with the process steps described

In general it may be said that both the larger and the less large production locations produce more than one feed per location, especially bulk. All the locations pelletise, crumble and sieve. A number of companies do double pressing or expansion. Nearly all the locations have facilities for delivery in bags.

4.2.1 Performance of compound feed companies with respect to traceability

Figure 9 shows the total results with respect to traceability for the 7 participating locations. The scores in the graph relate to total performance which is made up of the sub-areas information and integration. A higher score does not by definition indicate that both sub-areas have been properly regulated. A horizontal line in the graph indicates the Basic Level (70) and the Higher Level (90). The Basic Level refers to the minimum requirements in the area of traceability for animal feeds.

The figure shows that not all companies have achieved the Basic Level. The differences among the companies are however small. All the companies managed to score 60. None of the companies get near the Higher Level.

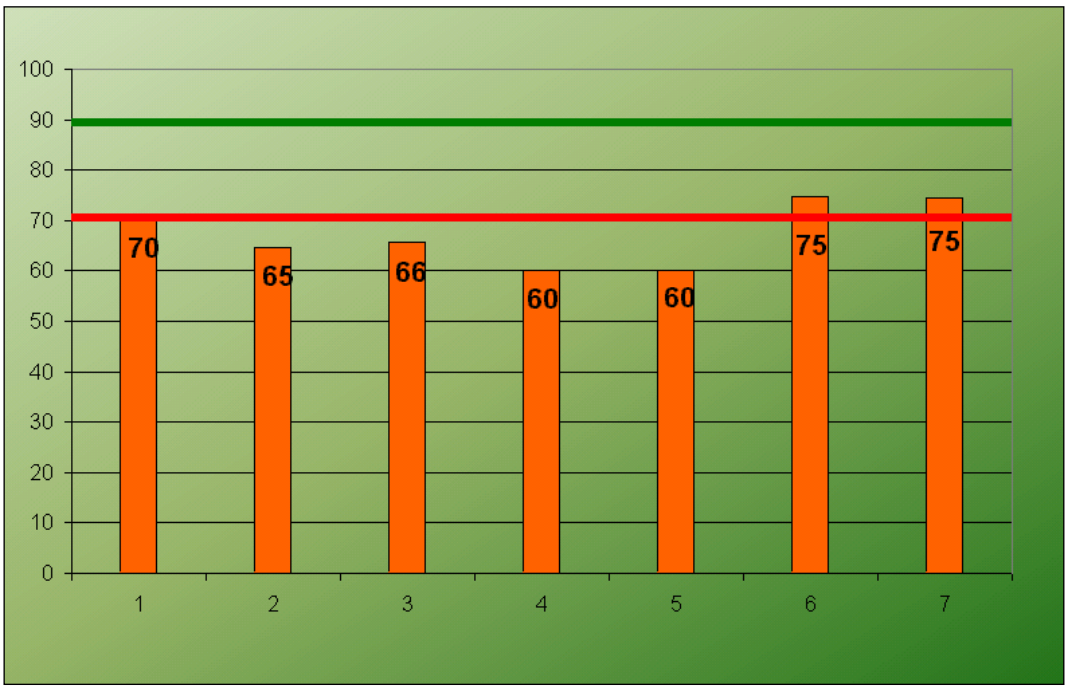


Figure 9: Tracking and Tracing performance of the 7 locations

In figure 10 the scores are split by the sub-areas information and integration. The ‘quantity of information’ and the ‘quality of the information’ fall under the sub-area information. This includes both the available information on the feeds produced, the raw materials used and the production processes. ‘Retrieval speed’ falls under the sub-area integration. Retrieval

speed relates to the detail level of problem tracing and the speed of supplying the required information in the event of a recall.

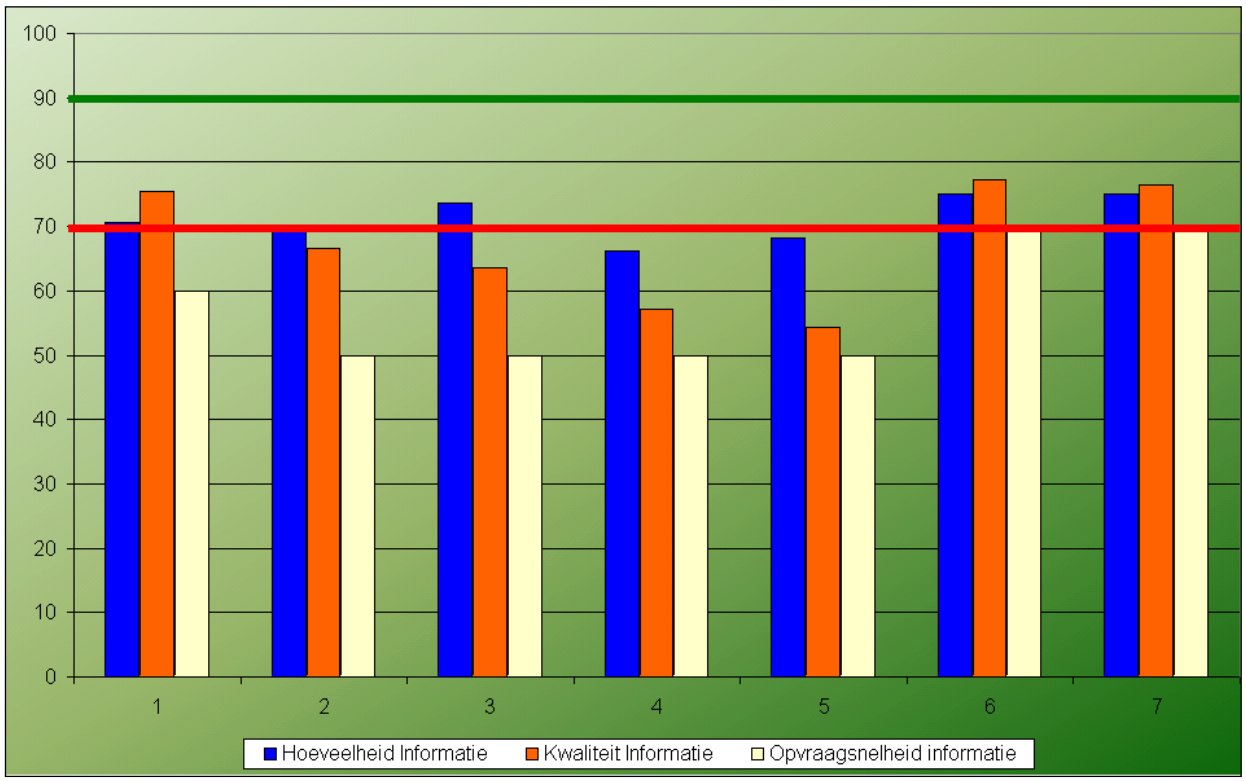


Figure 10: Performance of the 7 locations in the sub-areas of traceability

Figure 10 clearly shows differences among the sub-areas. Thus, most companies score reasonably well with respect to the amount of information available. Most companies score less well on the quality of the information. One should think here in terms of insufficient detail in the information and insufficient uniqueness in the codes used. The scores for retrieval speed are relatively less good in nearly all the companies.

In summary, figure 10 shows that none of the companies achieves the Higher Level in any of the sub-areas (score equal to or higher than 90). The Basic Level is attained with respect to the amount of information. The information can not however be retrieved quickly and the quality is generally open to improvement. The Basic Level for this was reached by only three companies but the distance to the Basic Level for the other companies is not too great.

A further explanation of the results above is given in the following sections. The strong and weak points of the current compound feed production companies traceability systems will also be addressed.

4.3 Performance in the sub-area information

This section discusses in detail the results for the information sub-area.
The information sub-area can be further divided into information relating to: origin derivation, the actions taken, the degree of detail, the uniqueness of the coding and the availability of the information. These items are discussed further in the following sections.

4.3.1 Origin derivation

Origin derivation relates to being able to derive information about the origin of the raw materials, semi-manufactured and end products used. The performance of the companies with respect to origin derivation can be seen in figure 11.

Inspection of the average score for origin derivation for all the compound feed companies shows that two companies achieve the Basic Level. The other companies with a score of around 65 points are close to this level. None of the companies achieved the Higher Level.

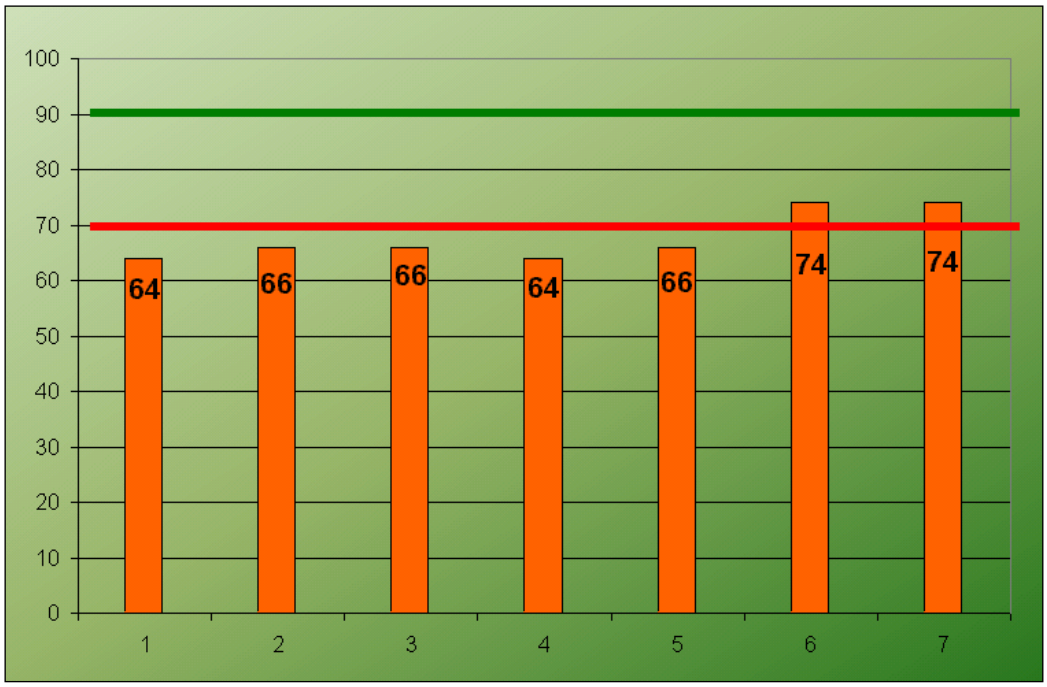


Figure 11: Origin derivation performance for the 7 locations

Figure 12 shows the average scores for origin derivation for all the compound feed companies for all the process steps in compound feed production. This figure also shows in which process steps origin derivation is well organised and in which process steps this is less so.

Three bars have been shown per process step. The first (white) bar shows the minimum score achieved for all the companies. The average score for all the companies is shown by the second (orange) bar. The maximum score for all the companies is shown by the third (blue) bar.

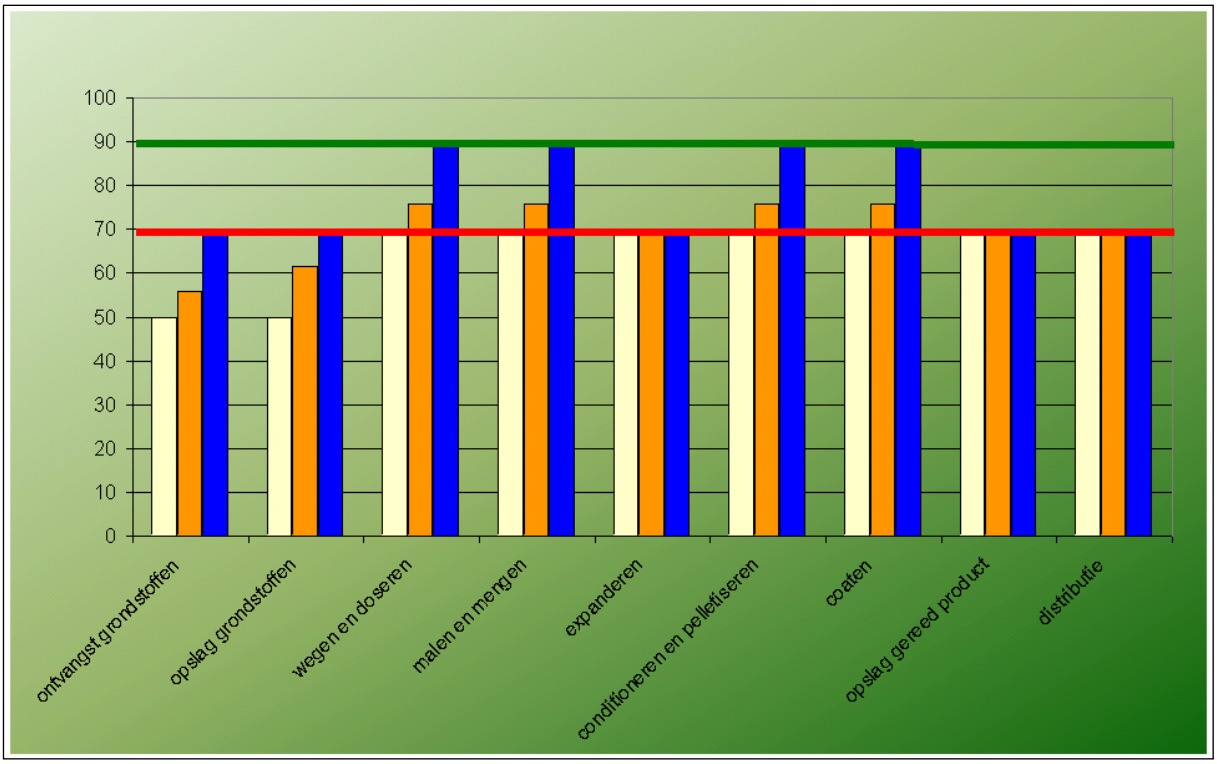


Figure 12: Performance on origin derivation per process step

The figure shows that the scores for the first two processes are on average under the Basic Level. The Basic Level is attained for all the other processes and sometimes the Higher Level is reached. Two locations score the Higher Level for the other processes.

4.3.2 Description of the results for origin derivation

If one looks at the extent to which raw materials can be derived in the chain then it appears that the origin of raw materials can be demonstrably traced up to the importer. Some companies can do this up to the exporter. Tracing to the primary producer is not possible for most raw materials.

Reception of raw materials lies as far as origin derivation is concerned under the Basic Level with an average of 56. Each company records all the basic data on the raw material and the supplier. Figure 13 shows which data is available at the compound feed companies with respect to the reception of raw materials.

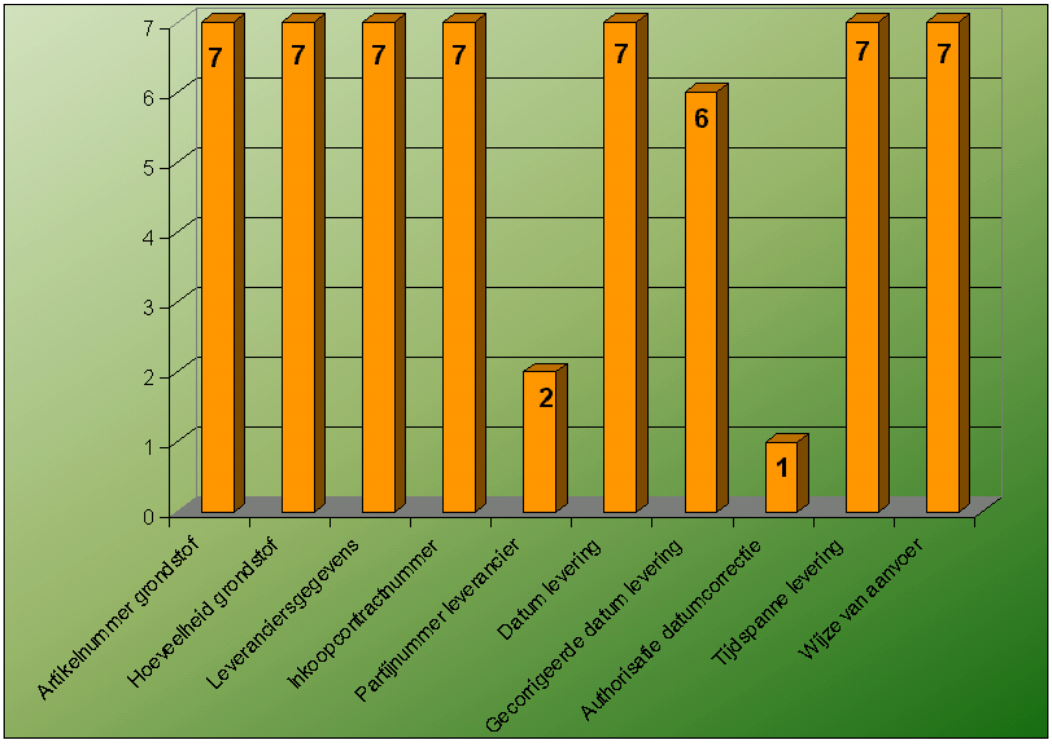


Figure 13: Number of companies with the specified data records for the storage of raw materials

Corrections to the delivery date are made by most companies without any authorisation being necessary. The Higher Level is not reached because supplier batch numbers are not usually used. Also incoming batches are not usually sealed.

The storage of raw materials shows the same picture. The average score for all the companies was 61 points. Not all the companies worked with batch numbers in the storage of raw materials. This means that it is not known which raw materials are physically stored in particular silos and storage locations. This also applies to premixes and minerals. This data is often available administratively. Registration is done when a batch is dumped in a different silo than was planned. Renumbering of batches usually does not take place.

The Basic Level is reached for the other processes in figure 12. This applies from the process 'Weighing and dosage' up to and including the process 'Distribution'. During processing the date and the time of the allocated raw material can be discovered. The amounts and silo numbers of the actual raw material provided are maintained. Internal batch numbers for raw materials are not usually used. This was always done at two locations. This resulted in a Higher Level score. Internal batch numbers are used more for minerals and premixes. It is however noticeable that many companies have no fixed storage location for micro components in bags.

The start of a production is recorded at most companies based on the article number combined with the date and time. At some companies a production run is recorded based on a production run number. The article number is also used for recording the silo in which the finished product is stored. The customer is recorded for the feed via the UBN number and

the combination of article number and feed type. The use of the production run number combined with customer details is not often seen.

Items for improvement for origin derivation
On the basis of the above results the following major items for improvement with respect to traceability in compound feed companies may be mentioned:

- *Storage of raw materials based on an internal raw materials batch number;*
  For an accurate internal identification of a batch of raw material it is important that the raw material are given a unique code and that they are then stored on the basis of this unique number. At a later stage it can then always be seen which batch of raw material was stored in which silo.

- *Storage of micro components based on an internal batch number;*
  For an accurate internal identification of micro components it is important that the micro components are given a unique code and that they are then stored on the basis of this unique number.

- *The recording of the supplier's batch number;*
  In the event of complaints about a raw material or a micro component it is good to know the batch number of the supplier in order to be able to specify a particular batch of raw material. The record is particularly important if it later appears that the cause of a particular problem lies in a raw material or micro component which was used.

- *Allocation of raw materials and micro components for products on the basis of an internal batch number;*
  In order to know afterwards which raw materials and micro components were used in the production of a particular feed it is important to know in which specific batches the raw materials were used. This can be done by knowing from which silo or tank the raw materials were taken and then finding out which batch numbers of raw material were stored in it.

- *Making more information available for the supply chain.*
  Currently only summary batch information is available for a raw material. In the future it may be beneficial to make more information on a specific batch retrievable. Agreements can be made on this can be made with the suppliers. The registration or making available of delivered raw material batch numbers could be a good start.

4.3.3 Recording actions performed

With respect to the amount of information, questions were asked of the compound feed companies about the recording of the actions taken. The recording of the actions taken was examined for each process step within a company. This referred to the registration of process and production data and possible process control data.
The companies score reasonably well in the recording of the actions taken. Figure 14 shows that the basic Level is easily attained by many companies. Only one company did not meet this level with a score of 68 points. The highest score of 80 would seem to mean that the step to the Higher Level is within reach. By, among other things, recording correc-

tions to delivery dates, recording the silo number and the use of a fixed frequency for silo empty reporting, the level could be attained.

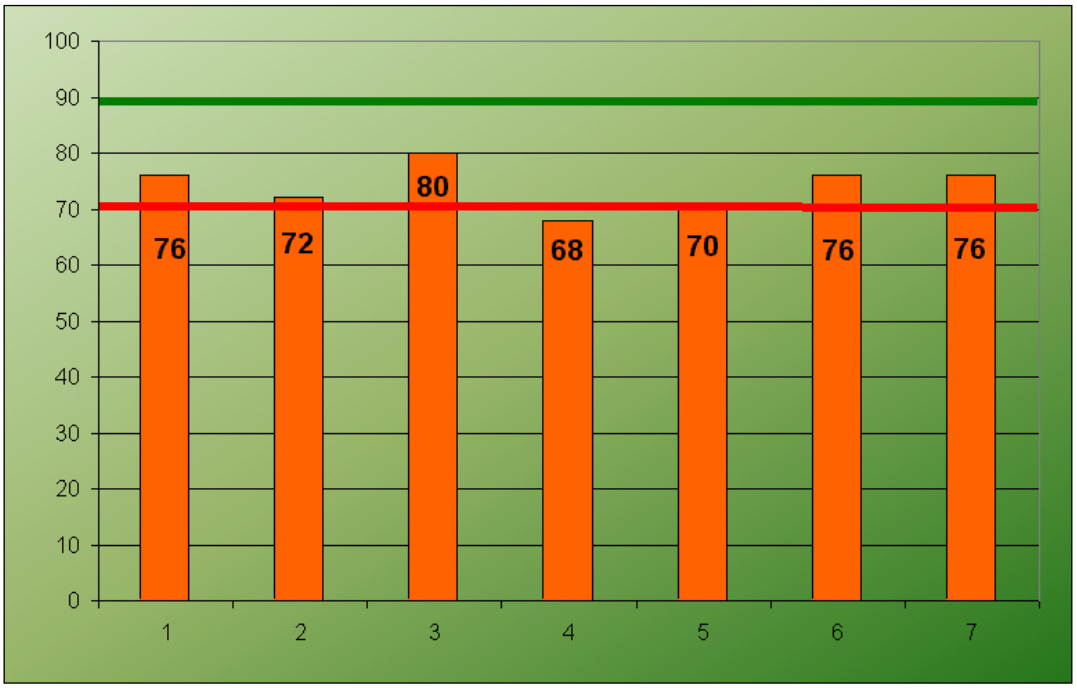


Figure 14: Performance with respect to recording actions taken

The recording of actions taken relates to every process step in a company. The performance per process step is shown in figure 15. It can be seen that on average the companies scored less well in the processes receipt of raw materials, storage of raw materials and distribution. A higher performance than the Basic Level was attained for the other processes.

4.3.4 Description of the results with respect to recording actions taken

When receiving raw materials the time of delivery and corrections to this time were not always recorded by all the companies. General details of the transport data were recorded such as name, address, place and vehicle registration were recorded but the recording of the transport data was often missing. During the entry check the weighing results and delivery specifications were compared to the purchasing specifications. For the data registration for receipt of raw materials see figure 13.

The receipts for external returns were also checked. A record is kept for the external return of the reasons for the return and the sender of the return is recorded. No record was made of the load silo number of the farmer. The Higher Level was not reached because the companies do not allocate a new internal batch number to the batch in the event of an external return which is linked to the name and address details of the supplier of the return.

Samples are taken from the incoming batches on reception. This does not occur always for all raw materials but it does occur for all critical raw materials. The period of retention for

the samples is equal to the period for which the raw material can be kept. Some compound feed companies retain samples longer than the period for which the feed can be kept (Higher Level). The samples are correctly stored and labelled. The label details for the samples are not however separately recorded by all the companies. Also, incoming raw materials are organoleptically checked. Records of this check are not always made. This does occur with suspect batches which are kept separate.

In general the frequency of reporting the cleaning of silos and dumping pits is low. The frequency of reporting cleaning of liquid tanks and boxes is very low. Many companies do not have a fixed frequency for reporting cleaning. With respect to cleaning, however, the companies do follow the GMP guidelines. Frequent reporting of cleaning is difficult in practice for companies with a limited number of silos and liquid tanks.

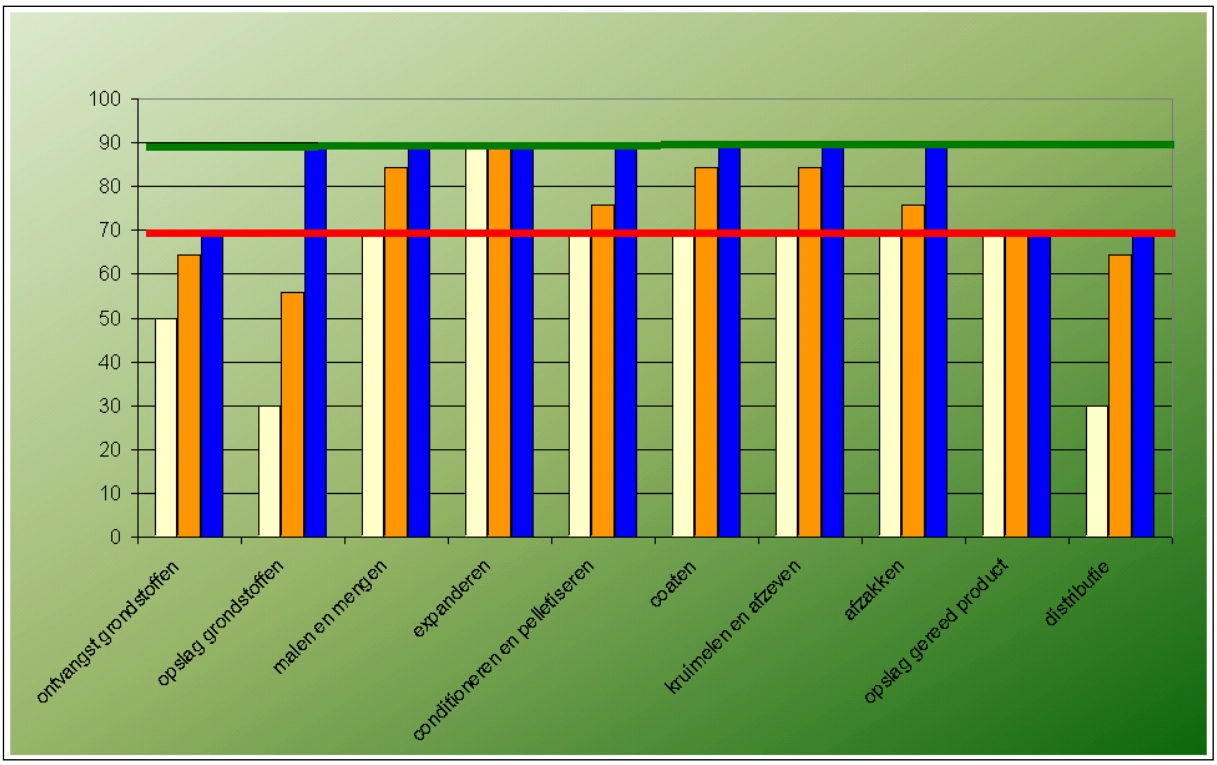


Figure 15: Performance on actions taken per process step

The storage conditions are recorded during the storage of raw materials. The storage sequence is usually recorded. Fewer records are kept of processing and any complications during storage. Also, a link is not always made to an internal batch number. This means that it is not always known which raw material batch number is stored in which silo. It is of course known which raw material article number (= type) is stored in a silo.
In those companies which do link a raw material batch number to a silo number, the complications during storage and sometimes both the date and the internal batch number are recorded. The Basic Level for actions taken in the storage of raw materials is not achieved with the average score of 56 points. There is often a lack of records on the processing of raw materials during storage or complications during storage with a link to the batch number in question.

The minimum Basic Level is attained for the processes ‘Grinding and Mixing’ up to and including ‘Storage of finished product’. The Higher Level is often reached in these processes. During production there are god records of the planned and actual amounts used of raw materials and raw material types. These records are linked per line to an article number or (in 6 of the 7 cases) to a production run number. Only during bagging and during the storage of the finished product (in silos and in boxes) is this link to the production run number missing for a number of companies. At only one company was the allocation of raw material to a production run done on the basis of the allocation of raw material internal batch numbers.

Reports of empty and cleaned production lines and finished product silos are generally open to improvement. Many companies do not have a fixed frequency for reporting cleaning. With respect to cleaning, however, the companies do follow the GMP guidelines.

Samples were taken of all the batches of end product. These samples are in theory kept for the period for which the feed is usable (comparable to the GMP guideline). In a number of cases it was observed that samples were only kept for one month.

4.3.5 Items for improvement for recording actions taken

The results described lead to the following items for improvement with respect to the registration of actions taken:

- *Determination of higher frequency of reporting storage locations empty (incl. boxes);*
  The frequency for reporting storage locations empty is currently relatively low. Reporting storage locations empty is however a major calibration point in delineating any problems because one can be certain that the silo was empty at that point. If the period between two empty silo reports is too long then the size of the problem will be greater. More frequent reporting empty of storage locations, certainly for critical raw materials, is a major item for improvement.

- *Allocation of production run number to production runs;*
  For companies which work on the basis of article number of the feed in combination with date and time. It is however more specific to distinguish a production run number per production run to which the product and process records are linked. This creates a unique batch. This method of coding is important especially in the circumstances in which multiple runs of the same feed are produced on the same day.

- *Records of the handling of internal and external returns;*
  Internal and external returns are a difficult item with respect to traceability.

  The best possibility for the internal returns is to mix the feed in the same production run. Where the returns are stored in interim storage from which the feed is used in subsequent production runs, it is more difficult to trace. It is important to record the amount of mixing, from which silo it came and that the feed is from the same type of feed.

  For external returns the cause of the return should first be investigated and recorded. If the feed is accepted into the production process again then a new batch code will have to be allocated in order to be able to identify this raw material at a later stage.

- *Increased frequency for reporting empty waste cells;*
  The frequency for reporting waste cells empty is currently low. Due to the great variation in composition and the often low dosage in the feeds, waste can cause a large 'oil stain' effect in the event of problems. By raising the frequency of reporting waste cells empty a smaller delineation can be established in the event of a recall.

- *Storage of finished product on the basis of production run number;*
  The storage of finished product is usually done in silo numbers on the basis of the article number of the feed. It is important for a better identification of the feed to store the feeds on the basis of the production run number. If feeds with the same production run numbers are in multiple silos then the record of time and amount linked to the silo number is important.

- *Bagging on the basis of production run number instead of just article number.*
  The bagging of the finished product takes place in practice nearly always on the basis of the article number of the feed (coming from a particular finished product silo). It is better for a proper identification of the bag that the production run number of the feed is linked to the bagging date and time. At a later stage one may more accurately see which feed from which production run is in the bag.

4.3.6 Degree of detail in information

The degree of detail in information addresses the question of how specifically the recorded information within the company can be linked to a specifically defined batch. If the linking of records to a specifically defined batch of product is done properly then the score for this sub-area will be very high.

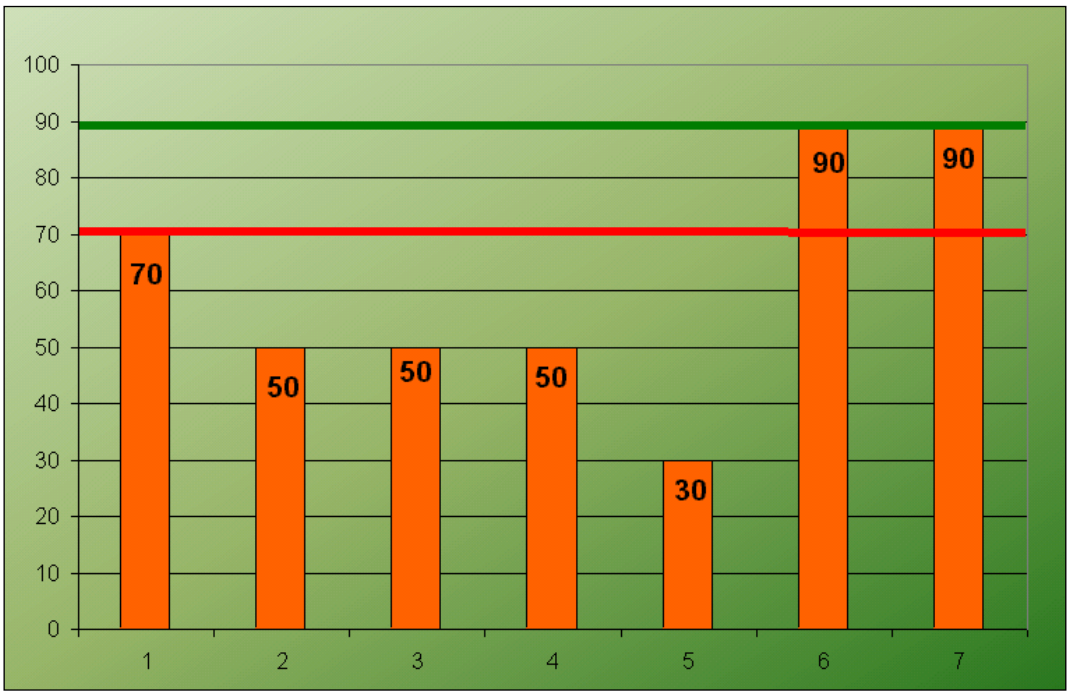


Figure 16: Performance of the 7 locations for the degree of detail of information

Description of the results for information detail
The degree of detail of the information is shown in figure 16. Two companies attained a Higher Level score. These scores are achieved through a clear link between the administrative batch records and the physical batch administration. The internal batch administration for these companies is also fully supported by linking all registration documents to a batch of raw material, semi-manufactured or end product.

One company scored at the Basic Level and the other companies did not reach the Basic Level. This lower performance was achieved through the lack of a clear link between the administrative batch records and the physical batch administration. In this case it is possible that other data is recorded in the records than what actually physically took place.

A positive point with respect to the amount of detail is the size of the production charges used at the companies. These mostly correspond to a maximum of one production day and for many companies they correspond to a period which is shorter than a day. A smaller production charge has the advantage that in the event of a problem it is easier to make a link to a production date and the raw materials and micro components used.

Items for improvement in the degree of detail
The following items for improvement may be mentioned following the above results:

- *Good link between administrative batch administration and physical batch administration;*
  In the production of animal feeds it is difficult to achieve a 100% physical separation of raw materials, semi-manufactured and feed end products.

This is because the storage of these products is usually done in large silos and it is usually not practically or economically feasible to store one batch of product in one silo. It is quite possible in the administrative sense to achieve 100% separation of the product. This brings about the danger that the physical product flow does not correspond to the administrative product flow. For traceability and problem solving later on using the administrative records this leads to incorrect identification and delineation of the batch. It is therefore important to link the physical and administrative goods flow to one another properly. Account will have to be taken in this of the possibilities and impossibilities of silo storage.

- *Setting up a checkpoint for the validation of the physical and administrative link;*
  Often when separating batches use is made of data in the administrative system. In order to guarantee the correctness of this it is advisable to validate physical and administrative data regularly.

- *Expand the batch administration to distribution.*
  It is important to expand the batch administration to storage of finished product and distribution in order to be able to see later which batch of feed went to which customer. On the basis of this information the company can then find out where else the feed in question went to and which raw materials were processed in these feeds. Here too the physical batch administration will have to correspond with the administrative batch administration.

4.3.7 Availability of information

The availability of information relates to the information which is available for the company or the partners in the chain if this information is necessary for example in the event of an emergency. The performance with respect to the availability of information can be seen in figure 17.

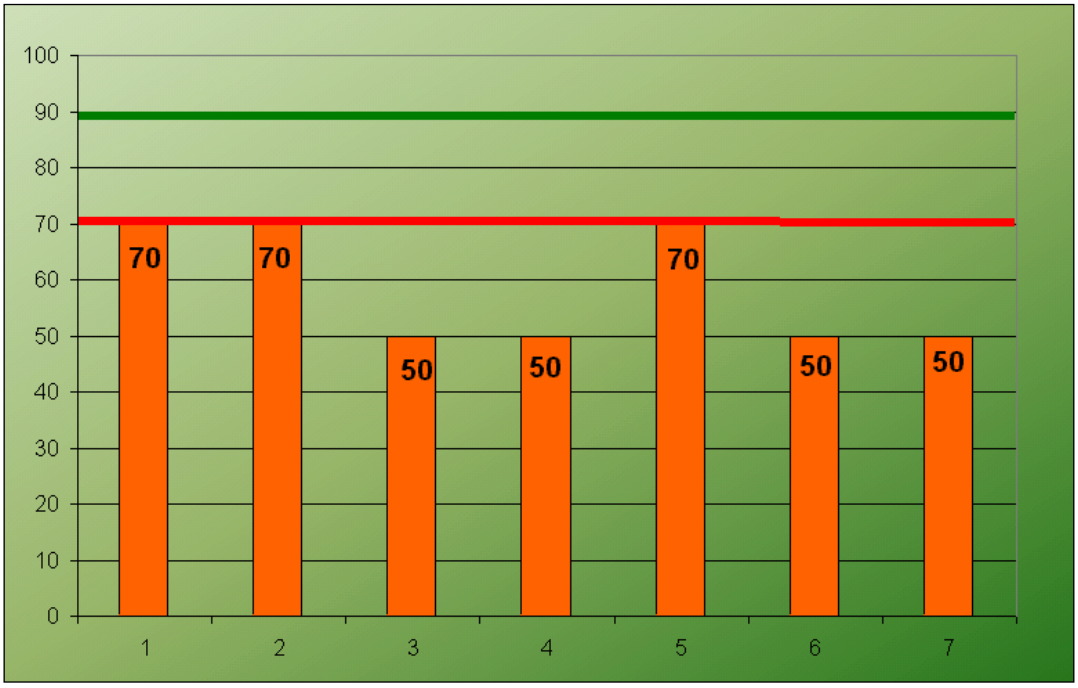


Figure 17: Performance of the 7 locations for the availability of information

Description of the results for availability
Three companies reached the Basic Level with respect to the availability of information.

End products which are bagged are generally well labelled. The same applies to the information on the bulk slip. In every case however there is an important detail missing on the bulk slip or packaging, namely a code which is linked to the production run number. This makes it difficult to find out after distribution of the end product from which production run number the customer has received product. This number is usually required finally to trace the cause of a problem.

Figure 18 shows a summary of the recording of data by distribution. This means here the available data on the bulk slip or on the packaging of the bag.

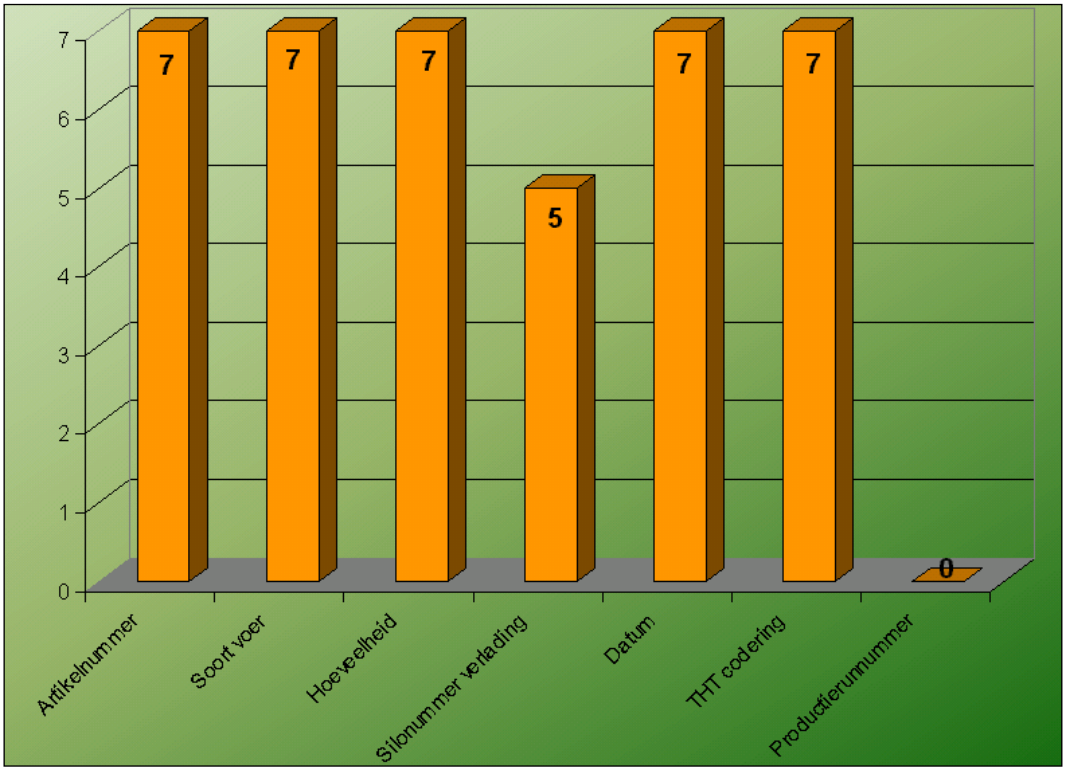


Figure 18: Number of companies with data recording on the bulk slip

In looking up data use is made of batch, customer and article numbers. One to fours hours is needed to make a selection of the requested data for a company. Within this period of time the customer data can be made available and using the production date on the bulk slip or packaging it is then possible to work out when the product was made. The production run data and the raw material data can then be traced in other systems. Making data available by using more than one information system which records the various details means that it takes a little longer. Often part must be traced manually which is generally time-consuming. A number of companies have standard formats for processing in a report those selections which occur.

Items for improvement in availability

- *Placing the production run number or article number combined with the production date and time on the bulk slip or bag;*
  The data for a batch is easily available if it is printed on the bulk slip or the bag. Using a code which refers to a particular production run, the relevant batch details can then be retrieved. Currently none of the companies use this reference on the bulk slip but this is recommended for the future.

- *Making batch data available more quickly;*
  The compound feed companies register a lot of data from the receipt of the raw materials up to and including the distribution of the product. In many companies however the data is stored separately in different systems.

Thus process computerisation is often separated from the logistical and commercial computerisation. Because of this it is often difficult to make a quick summary of all the batch data because the various systems (and manual lists) have to be matched up. The data can however be made available more quickly if links are made among the various systems.

4.3.8 Uniqueness of coding

Uniqueness of coding covers the company internal coding for production lines, storage areas, raw materials, semi-manufactured and end products. If a company delineates the parts referred to properly and then gives them a unique code then a high score will be given for this sub-area. A combination of details can also lead to a uniquely identified unit of product.

Description of the results for uniqueness of coding
The score for uniqueness of coding is shown per company in figure 19. This shows that the majority of the companies have already exceeded the Basic Level of 70 points. Two companies can however still take measures to reach the Basic Level.

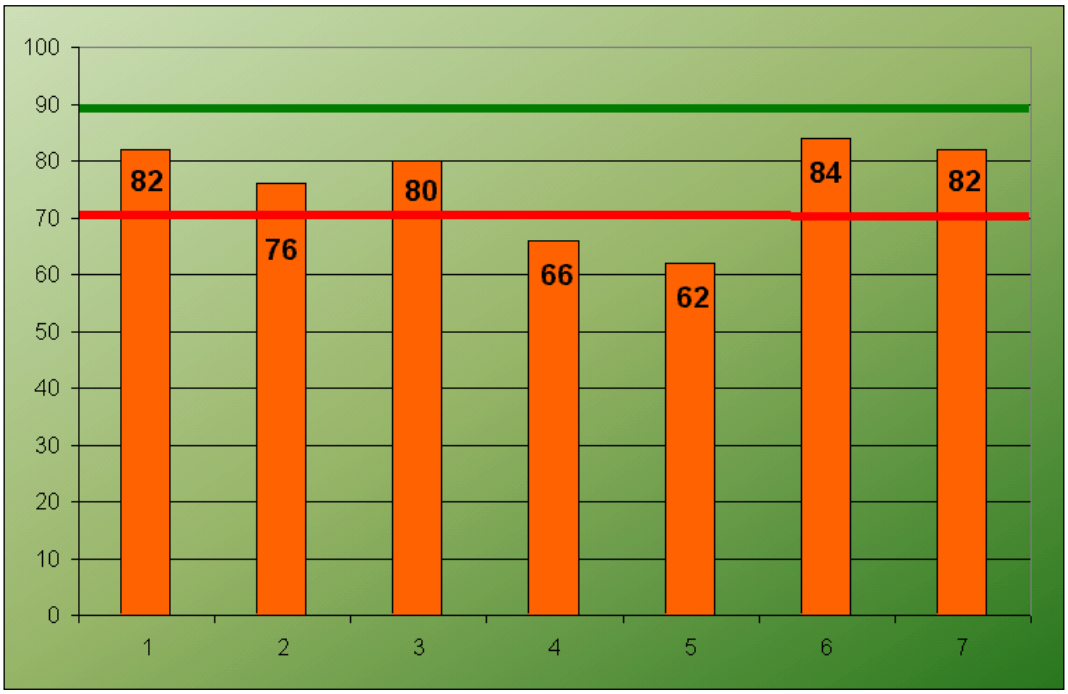


Figure 19: Performance of the 7 locations for uniqueness of coding

The uniqueness of coding is shown in figure 20 for each process step and for all the companies. As in the actions taken the major items for improvement are in the reception and storage of the raw materials and in the storage of the finished product.

The Basic Level is not reached by a number of companies for the receipt of the raw materials. In coding raw materials and additives use is generally made of a combination of the delivery date and the type of feed (article number).
An internal batch number is not created by all the companies and the batch number of the supplier is not recorded. The batch details are registered in most cases. The absolute data on the coding of raw materials in the companies is shown in figure 21

The raw materials are stored in uniquely numbered silos. The micro components are not stored by all the companies in uniquely numbered locations. None of the companies create new internal batch numbers for internal and external returns.

Storage locations for finished product are often provided with a unique number. These include silos. For bags this is less usual and boxes are usually not provided with a unique number. A physical batch administration is often missing for the finished product because from the moment that the product is dumped in the silo the link to a production run number is broken.

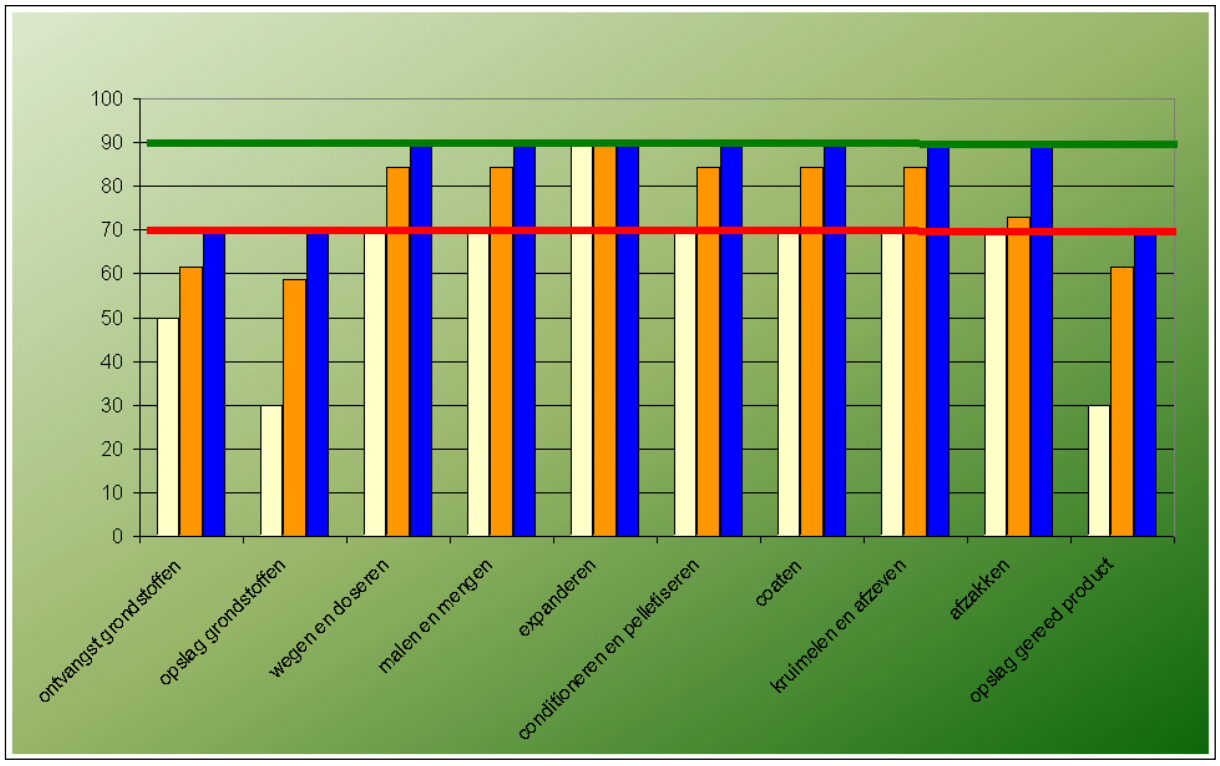


Figure 20: Performance on uniqueness of coding per process step

A higher performance than the Basic Level was attained for the other processes in figure 20. These are the processes ‘Weighing and dosage’ up to and including ‘Bagging’. An average score of 84 points is not unusual. This indicates that the coding in production is clear. Only the link between an article number and, for example, a production line number is missing for most companies. Allocation to a line often occurs by way of the combination

of line and article number. The link between administrative and physical batch data is not always present. During bagging the link to production run numbers is often missing.

Also the ambiguity of the coding is open to improvement in companies which have more than one site.
It may occur that the same codes are used for products at different locations so that these products can not be properly distinguished later.

Items for improvement in the uniqueness of coding

- *Allocating an internal batch number to raw materials and micro components;*
  For an accurate internal identification of raw materials and micro components it is important that the raw materials and micro components are allocated a unique code and that they are then stored on the basis of this unique number. At a later stage it can then always be seen which batch of raw material or micro component was stored where.

- *Allocating a new batch number to internal and external returns;*
  To achieve the correct identification and registration of return flows it is important to see these return flows as new 'input' into the production process. This is possible by handling these returns as new raw materials or semi-manufactured products and by allocating them a new internal batch number. This certainly applies to external returns. For internal returns which are collected together in a large silo this is impossible at batch level but there are opportunities in the unique coding of a batch between two empty silo reports.

- *Coding of storage locations including for micro components;*
  Silos are generally uniquely coded but the storage locations for micro components in bags are usually not. The information is however on the bag label so that it is relatively easy to identify the bag properly. There is a chance of misidentification when packing bags for production. It is important to avoid this misidentification. A possibility here is to work with unique storage locations for bags.

- *Allocation of production run number to production runs;*
  For companies which work using the combination of the article number of the feed and the date and time it is more specific to distinguish a production run number per production run to which the other product and process records are linked. This creates a unique batch. This method of coding is important especially in the circumstances in which multiple runs of the same feed are produced on the same day.

- *During bagging link the production run number to the bagging date and time;*
  The bagging of the finished product takes place in practice nearly always on the basis of the article number of the feed (coming from a particular finished product silo). It is better for a proper identification of the bag that the production run number of the feed is linked to the bagging date and time. At a later stage one may more accurately see which feed from which production run is in the bag.

- *Improve the identification of boxes and big bags;*
  Currently the identification of boxes and big bags is not unique and there is no clear record of which feed is stored from which production run. This is sometimes done by

seeing a group of boxes as a unit and by identifying this as a group. It is important to improve coding and recording of storage in boxes and big bags so that later identification is simpler. The measures which apply to bags may also be used for big bags where the production run number of the feed is linked to the bagging date and time. A good label should be applied.

4.4 Results for the sub-area integration

4.4.1 Problem tracing and recall management

Tracing a problem covers the tracing of a problem on the basis of a complaint where the records serve as a basis for finding out what the problem is.

The scores per company are shown in figure 21. Reaching the Basic Level seems still to be difficult. Two companies comply but the others have not reached the Basic Level.

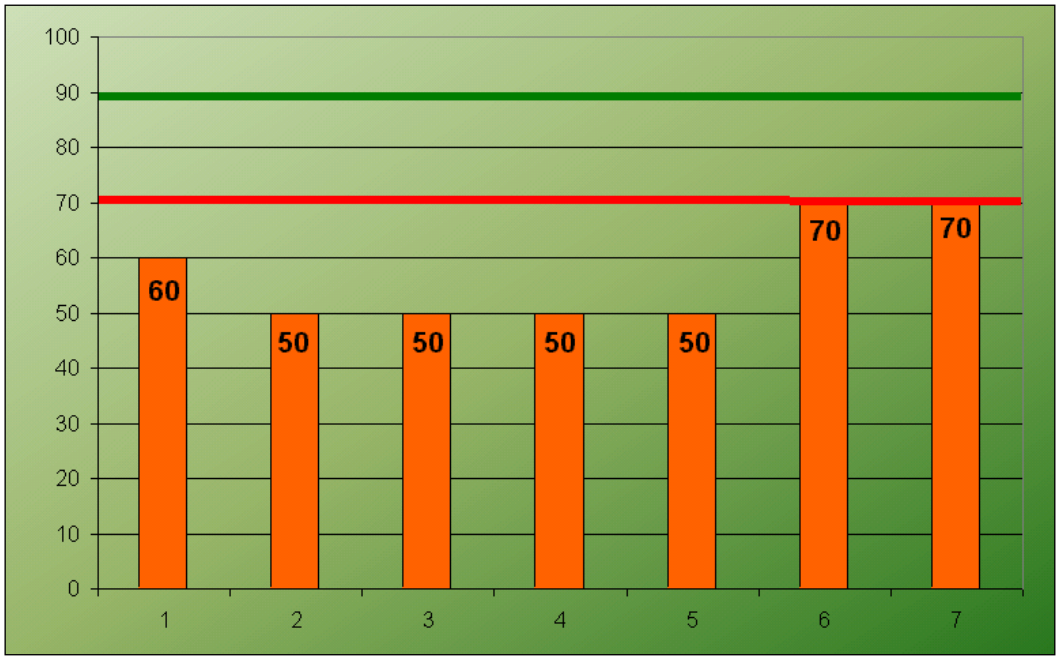


Figure 21: Performance of the 7 locations for problem tracing and recall management

Description of the results for problem tracing and recall management
The time which it takes to retrieve the administrative data for a delivery to a single customer of the specific batch amounts in just one case to less than four hours. Most companies say they can do this in a maximum of twelve hours. The compound feed companies need a maximum of twelve to twenty-four hours to trace the raw materials for this batch and to trace the other batches in which these other raw materials are processed. Problem tracing is usually at day level. Some companies can do this up to the batch level. Problem

tracing at ingredient level occurs at two locations. The times for problem tracing exclude inspecting the data for return and/or waste management. Looking at these details in depth will cost the companies more time.

In the event of a recall most companies can trace the customer who received the batch in question within four hours. It is sometimes possible in less than one hour.
The tracing of customers who have received batches with the same raw materials is often done in less than eight hours. The size of the recall is determined on the basis of FIFO supplemented by safety margins because it is not known exactly how the silo emptied. None of the compound feed companies has examined how the silos empty to be able to use a reliable safety margin in addition to FIFO.

None of the companies involved worked with the period between two silo empty reports to delineate the size of the recall. A practical solution for this is to block and recall the feed which is still in stock (at the company, at the distributors and at customers).

Flow behaviour in silos

The flow behaviour of raw materials in silos is dependent on, among other things, the construction of the silo. In addition to the angular and conical forms attention must also be paid to the material from which the walls are made. Coated material has a lower level of friction. Also, in some silos there is a provision for assisting the flow and avoiding arching. The method of supply of the feed also determines flow behaviour. This may either be free fall or a supply via chutes and is done through one or more filler openings. In addition to the frequency of supply and removal of the product, the product itself plays a major role. This is a matter of the surface area of a particle and also characteristics such as the form, temperature, moisture content and the additives present such as fat. The storage time and the storage conditions are factors which can also influence the flow of the product.

In ideal circumstances it is possible in a recall to determine the quantity of products to be recalled on the basis of FIFO with a safety margin of 5%. This 5% should be related to the content of the silo.

In practice the size of a batch for a recall must be delineated on the basis of FIFO with a larger margin of safety of, for example, 30%. This margin applies for the batch which was stored in the silo prior to the batch in question and that which was stored after the batch in question. From these two batches an amount of 30% of the amount of the faulty batch will be included in the recall. This margin may be set lower if companies can demonstrate that it controls the silo outflow behaviour

General guidelines cannot be given because too many variables have an influence on the flow behaviour. For an accurate determination of the safety margin to be used, specific research must be done per product and silo.

Items for improvement for problem tracing and recall management
The performance in the area of problem tracing and recall management leads to the following items for improvement:

- *The level of detail for problem tracing must be more specifically delineated;*
  The level of detail for problem tracing will have to be more specifically delineated in order to be able to react quickly and properly to a possible recall. In most cases the level

of problem tracing is equal to a day's production. Up until now this has been the level of a production run in only a few cases. In order to delineate a problem well it is important to keep the smallest identifiable unit as small as possible. A production run is in many cases a smaller unit than a day's production.

The delineation of a recall on a FIFO basis requires clear safety margins;
The size of a recall is determined using FIFO outflow from raw material and end product silos.. It is important to set a correct safety margin because FIFO outflow behaviour is not known exactly at most companies. Certainly in the case of critical products it is important to select a wide safety margin.

- *The speed of action in the event of a recall demands a properly linked internal information facility;*
  In order to be able to act quickly and correctly in the event of a recall it is important to have rapid access to the relevant batch data. It is advisable to make good links among the various internal information systems. Currently a lot of information is stored in bits so that the gathering of the information takes a lot of time.

4.5 Results for the sub-area technique

By technique is meant the means which make to traceability possible. A broad range of resources was found among the compound feed companies which took part in the practical inventory. These varied from a manual administrative system (maintaining all sorts of lists) to far-reaching computerisation. A distinction may be made in the computerisation among production (the process computerisation), commerce (customer, order and invoice data) and the internal and external logistical data. Use is often made of branch-specific software packages in which data on production, commerce and logistics are combined. Occasionally use is made of branch-independent ERP software. Many companies also make use of programs such as Microsoft Excel for additional applications. One should think in terms of the making of summaries.

4.5.1 Description of the current situation

It often occurs that the information is held in different systems per compound feed company. There are interfaces between the systems at the reception of raw materials and micro components the link between the stocks and process computerisation and at the shipment of finished product. The different systems are usually not linked together. In compound feed companies with different sites the range of resources for making traceability possible varies considerably among them. In addition computerisation among the different sites is often not linked. Some companies receive raw materials from production companies which belong to the same parent company. In this event also no automatic links are made for the use of relevant data.

The supply of information to third parties by compound feed companies takes place on request. Third parties cannot log into the information systems of a company.

Hardly any link can be made between the degree of computerisation and the availability of the data. A compound feed company which makes intensive use of a manual administration can with a well thought out system provide traceability insight in a fairly short time. It is however so that finding related information requires more time to leaf through all the lists. For a recall there is also some urgency which contributes to the making of mistakes in finding and copying data. Nevertheless a compound feed company with a modest production capacity can compete with other companies where there are multiple, unlinked systems. As the compound feed company becomes larger and more varied, the requirement for computerisation will show itself more strongly.

4.5.2 Items for improvement in technique

The following items for improvement arise from the above-mentioned observations:

- *Degree of computerisation*
  As the compound feed company becomes larger and more varied, the requirement for computerisation will show itself more strongly. This will mean that data which is important for traceability is more quickly available. The data is also more reliable due to the reduction in manual actions.

- *Linking of systems*
  It is not necessary for all the data to be brought into a single system. It is however important to have a good link among the various systems. This will ensure that data which is important for traceability is more quickly available. The data is also more reliable due to the reduction in manual actions. These arguments apply not only to the linking of systems within a single location but also to the linking of systems in various different locations in a single compound feed company and to any raw material production companies which belong to the same parent company.

- *Availability of standard searches*
  In a recall it is often a matter of searches of the same type, namely tracing customers who have received the same batch of finished product and tracing batches of semi-manufactured and finished product which was made from the same batch or batches of raw material. Currently this method working refers to bulk batches as hardly any of the companies have a batch and customer registration system for bags. To improve the speed and reliability with which the necessary data is made available it is advisable to have searches available ahead of time.

4.6 Conclusions

The following conclusions have been drawn on the basis of the results from the field study:

- *The Basic Level is feasible for all compound feed companies;*
  More than 40% of locations currently achieve the Basic Level. The basic level is feasible for companies for all locations by making minor changes.

Current level of animal feed tracking & tracing equal to or better than the foodstuff industry;
Comparative studies in the meat industry, AGF and foodstuff industry show that the performance of the compound feed companies which were examined for traceability are comparable or in some cases better.

- *Full separation of batches of bulk raw materials and materials in silos is difficult;*
  Aiming for complete traceability where every batch should be kept separate will mean large investments in the present circumstances and an increase in storage capacity.

- *Greater modifications are necessary for the Higher Level and are not feasible for every company;*
  In order to comply with the Higher Level modifications should be made particularly in the areas of storage, distribution and computerisation. This involves investment which is not feasible for every company in view of the amount of production.

- *Tracking & Tracing is the subject of attention in all the companies;*
  The presence of, among other things, procedures and specific responsibilities indicates that tracking & tracing is being given the necessary attention in all the companies. This is a good basis for further improvement.

- *Items for improvement in traceability lie primarily in processes before and after production*;
  It is important for good traceability that there is a good link between the incoming raw materials and the outgoing feeds. During the reception and storage of the raw materials and during the distribution of the feeds there is often mixing of batches. Traceability can be increased through improved physical and administrative separation of batches during these processes.

- *The production run number is the major thread through animal feed traceability;*
  Traceability can be increased in many cases by using production run numbers and by linking the relevant batches and batch information. The production run number can serve as the basis in this for traceability for the delineation of a batch.

- *Registration of data at compound feed companies is good;*
  A lot of data is already being recorded by the companies. This is a major pre-condition for good traceability. The level of detail in the records is in many cases open to improvement.

- *Speed of action during a recall is limited by insufficiently linked systems;*
  In order to handle a recall with speed it is important to have rapid access to the relevant information. As in many companies the information is stored in different locations and in different systems it costs a lot of time to collect the relevant data if there is no good link.

- *Improve insight into the information structure in order to improve the efficiency and speed of data retrieval;*
  It is advisable to examine the current information structures and to see where the relevant information is available and how this can be reached. The speed of retrieval can be increased through better insight and through the linking of systems.

- *The specific flow behaviour of silos for the determination of FIFO is not known;*
  Batch derivation currently takes place on the basis of a determination of FIFO. The outflow of the raw materials and feeds depends on various factors. To increase accuracy it is advisable to base the FIFO determination per production location on the specific flow behaviour of the raw materials and silos instead of using a standard determination.

5 Model systems for the compound feed industry

5.1 Introduction

Chapter 2 describes the current situation with respect to traceability of compound feeds. During the project “Tracking & Tracing in the Animal Feed Sector” the Work Group Tracking & Tracing drew up a set of guidelines for the sector. These guidelines have been converted into a set of minimum requirements (= Basic Level). They are intended to provide assistance to companies in the sector with checking or setting up their own tracking & tracing system. The guidelines will be worked out into a model system in this chapter. The exact Basic Level guidelines have been included in appendix IV.

5.2 Tracking & Tracing system at the Basic Level

The model system is described in this section. The system addresses a set of physical and administrative measures which taken together ensure that there is compliance with the guidelines.

5.2.1 Basic principles for a Tracking & Tracing system

Before describing these measures for each step of the compound feed production some general basic principles for the tracking & tracing system will be examined.

- *The physical processes of compound feed production are the basis of the tracking & tracing system;*
  The physical processes of compound feed production form the basis of the tracking & tracing system; These processes are shown in figure 22. In the description of the system the administrative and physical traceability measures are given for each process step. The processes have been selected as the basic principle for allowing the model system to match as much as possible what happens in practice.

- *The Tracking & Tracing system harmonises with the current IT infrastructure of the companies;*
  The current IT infrastructure is usually established in accordance with the physical processes of the company. The Tracking & Tracing system will therefore also have to match the already existing IT infrastructure. In companies where there is still little computerisation the system will have to be able to work manually.

- *Recording of data in just one place: no double records;*
  Preferably, process and product data for a particular batch product will only be recorded in one place. This is, on the one hand, to avoid duplication of effort and, on the other hand, to prevent the data in question being amended in one location but not in another.

- *The data to be recorded is unambiguous and reliable;*
  It is important that the data is recorded unambiguously and that the data is also reliable for the future. This means that the data will preferably only be recorded in one place and that changes to the data are only made by authorised persons.

- *The data should be available within 12 hours to third parties;*
  The retrieval speed of information will be positively influenced by good batch identification and delineation within the company. This makes it possible to find the batches in question quickly and to make the associated data available. At the Basic Level it is expected that companies will be able to supply the batch details for a suspect batch within 12 hours(recall 1st instance)[4]. The companies should also be able to make known within 24 hours which raw materials were in the batch and in which other end products these raw materials have been used and where the end products are at that moment (recall 2nd instance).

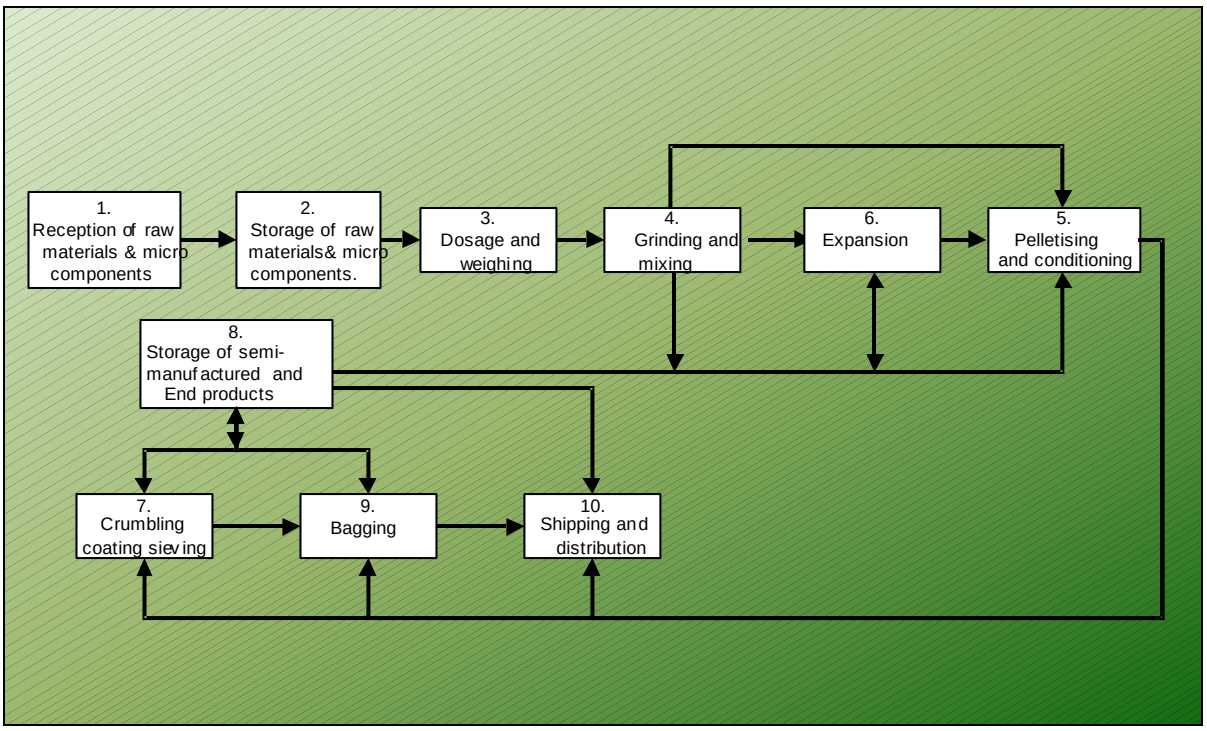


Figure 22: Main process diagram for compound feed production

- *The data can be made available either in writing or digitally;*
  The guideline for a system at the Basic Level is that the information is handed over in writing. The information may also, of course, be supplied digitally.

- *The data must be kept for at least 7 years;*

[4] See appendix V for an explanation of the terms recall in first and second instance

All traceability records must be kept for at least 7 years.

- *The size of a recall will be delineated on a FIFO basis with a safety margin;*
  The size of a possible recall will be determined using the principle that end products with a certain code (for example the production date) will be recalled.

  The basic principle for this will be FIFO for the distribution of the product. Because FIFO outflow from silos does not offer 100% reliability, a safety margin should be observed. At the Basic Level this margin is 30% plus or minus on the batch delivered according to FIFO if it can be demonstrated that a lower margin can be maintained on the basis of outflow behaviour from the silo.

- *The company should carry out a recall simulation and record the experiences.*
  In order to be certain in the event of a recall that the company can react properly it is important that the company carries out a simulated first recall. This simulation should be repeated every two years and in the event of any changes to the system. The findings of these recall simulations must be recorded and new insights incorporated into the procedure.

5.2.2 Description of a model Tracking & Tracing system at the Basic Level

The administrative and physical measures per process step for tracking & tracing are described below. This description begins with the reception of raw materials and ends with the distribution of the finished feed.

1. Reception of raw materials and micro components
Every incoming batch of raw materials or micro components is recorded in the administration using an ***internal batch number***. This number ensures that the batch is unique within the company. This is possible because the article number of the raw material is linked to the date of reception (for example the first batch of Soya lumps with article number 222 which arrives on 16 May 2002 will be given batch number 222-1-20516). This is the code by which the batch is known at the compound feed company. This code is then specified in all actions involving that batch of raw material (for example in the delivery records, stock records, etc.). If more than one batch arrives on the same day with the same article number then a sequential reception number is added (for example, the second batch of Soya lumps with article number 222 which arrives on 16 May 2002 will be given batch number 222-2-20516).

The administrative system for incoming goods for the Basic Level will have to contain at least the following data which is linked to the internal batch number of the raw materials:

- *Type and quantities of raw materials and micro components;*
  This covers a type of stock position which is already maintained in companies to be able to perform effective stock control. For the model system described here an article code will be used for each raw material which is based on digits.

- *Purchase contract number of the batch in question.*

By linking the batch (on the basis of the internal batch number) to the purchase contract number, it is possible later to compare the purchasing specifications and agreements with the physical delivery. The purchasing specifications of the batch are linked to the purchase contract number.

- *Records of checks on agreement between delivery specifications and purchasing specifications;*
  This can be recorded with a yes/no answer. The purchasing specifications are linked by the purchase contract number to the batch.

- *Record of delivery slip check against weighing result;*
  The delivery slips are provided internally with a unique internal batch number and this is linked to the stock administration system.

- *Delivery date and possible corrections to the planned delivery date;*
  As part of the stock positions a record is made per batch of the actual delivery date. If planned delivery dates are used in the current situation then a record is also kept of the actual delivery date.

- *Time of delivery.*
  The time when the raw material is unloaded following receipt.

- *Record of the name and address details of the supplier;*
  The name and address details of the supplier will be recorded for each batch. In order to avoid a lot of double work in a manual administration system use can also be made of a supplier code list. This is a list of the various suppliers to the company. In this way it is less trouble to maintain a fast and accurate record of received raw materials. Instead of the complete name and address details for the supplier it is sufficient to use the unique code for the supplier (see box).

A code list for suppliers

The full supplier details are shown in an Excel file for example (or Access or a contact management program). In this example only limited data is shown but this can be expanded if desired:

Name	Address	Postal code	Place	Contact person	Telephone	Articles	Code
Graanhandel "De transparante"	P.O. Box 123	1234 AB	Amsterdam	Piet Doorzichtig	06-12345678	Wheat	L01
Corntraders international	P.O. Box 12	2345 CA	Rotterdam	Jan Vrolijk	06-23456789	Maize	L02

On receipt of the raw materials it is sufficient to note the internal supplier code, for example L01.

Figure 23: A code list for suppliers

- *Record of the name and address details of the carrier;*

Like the supplier name and address data for the supplier, the name and address data for the carrier should also be recorded.

- *Method of transport;*
  Together with the delivery a record is made of the method of transport combined with the name and address data of the carrier and also the delivery date. In this way the transport history can be retrieved for the carrier at a later date.

- *Record of external returns;*
  A record is kept of external returns for the type of feed which is returned. The various types of feeds are given a specific article code based on the type of animal and/or risk group. This information is linked to the stock administration records.

- *Method working for internal returns.*
  The use of internal returns will be limited as much as possible to minimum amounts based on the internal risk analysis. Samples should be available from the internal returns so that if necessary samples can be checked later.

Coding of external returns

On receipt an external return (after a possible analysis) is stored in a return silo based on the type of animal and/or risk group. This return silo has a unique code. In the period between two empty reports for the return silo the product for that period will be marked with a new internal batch number. Pig feed for example with article number var123 will in the event of an external return be stored in return silo x with feeder VAR. In the event of the addition of these products in a new production run then the product will be mixed in as batch number 88888.

Figure 24: Coding of external returns

After recording the above data every batch of 'critical' raw materials (for example fats) will be ***sampled*** and the samples will be labelled. This label will show the internal batch number of the raw material. The samples will remain available for analysis for a period which is at least equal to the lifetime of the end feeds (and at least three months). Sample data will also be maintained in records.

On reception all raw materials will also be ***organoleptically checked*** and the results recorded per batch. A link from these records to the stock and production records must be possible. This link is possible by making a record using the internal batch number for the raw material.

Suspect batches of raw materials will immediately be held separately on receipt and the deviations observed will be recorded (using the raw materials internal batch number). The raw materials will be unloaded in a separate silo and only released if the batch is in order.

2. Storage of raw materials and micro components

All silos and fixed storage locations will be allocated a ***unique code***. This applies to all storage locations including, for example, liquid tanks. A record is then made of which batch numbers (for raw materials and micro components) are allocated to a storage location. The data is stored in such a way that it is easy to see which batches at a particular moment or during a particular period of time are or have been stored in a particular silo. If use is made of a planned destination for batches in certain silos then any deviations from the planning should be recorded (so that the actual situation is determined). If a raw material is turned over to another silo then this must be recorded.

Incoming ***external returns*** are stored in a separate return silo on the basis of type of animal and/or risk group. This return silo also has a unique code. A record is kept for the external return of the type of animal, the amount and the receipt date.

A record is kept of ***storage sequences and transport sequences*** in order to prevent contamination. No storage duration has to be recorded but the sequence does need to be recorded.
Any treatment of the product in storage will be recorded with a link to the silo number and the batch number of the raw material. This can be done by setting up a record of any process conditions in the silo or storage location linked to a date. One can then see which batches were in storage at the locations in question at that moment.

If ***tanks, silos and other storage locations*** become empty then they will be reported empty and then a record will be made that they have been ***reported empty*** (at least once per three months). This links the date of reporting empty to the storage location number in question. The reporting empty also applies to liquid storage tanks (at least once per three months). A solution for the lack of storage capacity can be the use of small mobile tanks. On reporting empty a mobile tank from the supplier can be used. The fixed liquid storage tank is then reported empty after which it can be filed with the new batch.

When ***storing batches of raw materials*** an attempt is made to match a batch as far as possible to the storage capacity. This means that batches of raw materials are stored such that:

- the number of batches stored in a single silo is as small as possible;
- a critical batch of raw material will be stored in a separate silo if possible.

The detail level of traceability will improve by trying for smaller storage locations. This may be smaller silos, tanks, etc. The delineation of batches of raw materials is then easier and more reliable.

3. Dosage and weighing

The start of a production run begins physically with the dosage and weighing process. The production start of a feed is coded administratively through the ***article number of the feed in combination with the production date***. During the whole production process the product is followed using this combination of article number and production date. Every new recipe in the system therefore has a unique code through the linking of the article number and the production date. This combination forms a sort of hallmark by which the product may be recognised in all the production run records. The allocation of the code is further explained in the following box.

Production records on the basis of article number and production date

At the Basic Level the recording of a production run is done on the basis of the article number of the end feed combined with the production date. The combination of these details makes the defined production run unique.
For example, an article number for pig feed is *var123*. This article number is produced on 23 January 2002. The combination of *var123 with production date 23-01-02* is unique for this production run. It may also be possible to link the recipe number for this run to this.

In this production, for example, 2 tons of raw material is added with internal batch number 4567 from raw materials silo x. In this way the production record can be used at any time to establish easily which raw materials and micro components have been used.

Figure 25: Production records on the basis of article number and production date

When the raw materials come out of storage the real production process begins. From this point onwards the route of the production run through the factory is fixed. The route which the run takes through the factory during production is laid down on the basis of the article number linked to the production date and time. The process records are also stored on the basis of this date.

The weighing and dosage lines are provided with a ***unique code***. The supply of (dry) bulk raw materials from a silo is recorded using the silo number and article number of the raw material combined with the weight or volume. In this the FIFO principle is used for the outflow from the silo. The FIFO principle can not be used for liquid raw materials but empty reports should be made at fixed times in order to be able to delineate batches.
The batch and silo data is also linked back to the stock records in order to keep the available stock up to date. Traceability can be improved in the short term by having a good estimate made of the outflow behaviour of silos. This makes it possible to make a better estimate of the batches of raw materials which have been stored at a particular location and which are processed in a particular production run.

Smaller amounts of ***raw materials or micro components which are weighed manually*** and then added will be recorded separately on a list or digitally. The exact weight used, the internal batch number of the raw material and the combination of article number and date will be recorded. The use of micro components should be done in accordance with the FIFO principle.

4. Grinding and mixing
The grinding and mixing lines are provided with a ***unique code***. The production run is linked to the specific grinding and mixing line on the basis of the article number and production date. Most raw materials and micro components which are used in a production run for compound feed have already been registered during weighing and dosage. If other raw materials or micro components are added during grinding and mixing then the exact weight used and the internal batch number of the raw material will be recorded. This is then linked in the administration to the combination of article number and production date.

The ***return flows*** which are created during the process will be processed as much as possible in the same production run. Internal return flows (weighed flows) which cannot be reused in the same production run will be stored in a return silo on the basis of animal type (in accordance with GMP+). From this the amount of product for the article number / production date and the number of the return silo will be recorded. Products from this return silo may be added in subsequent production runs to a maximum percentage of 5% or on the basis of a demonstrable risk analysis. Addition may only take place if there is no contamination hazard.

The ***return silo*** should be reported empty at least once per 3 months. The batch between two ***empty reports*** will be allocated an internal batch number. The addition of products to a production run will take place on the basis of this internal batch number. The records referred to will ensure that at a later stage it can be seen within the period of three months which production runs have contained the internal additions.

The procedure described above for internal returns also applies to the expansion, pelletising, conditioning coating and sieving processes.

5. Expansion
The expanders are provided with a ***unique code***. The production run is linked to the specific expander on the basis of the article number and production date. All micro components and other ingredients which are dosaged in a production run should be recorded in the same way as described in the weighing and dosage process. A similar procedure applies for the internal return flows as described in grinding and mixing.

6. Pelletising and conditioning
The pelletisers are provided with a ***unique code***. The production run is linked to the specific pelletiser on the basis of the article number and production date. All micro components and other ingredients which are dosaged in a production run should be recorded in the same way as described in the weighing and dosage process. A similar procedure applies for the internal return flows as described in grinding and mixing.

7. Crumbling, coating and sieving
Here too the production lines are given a ***unique code***. The production run is linked to the specific production line on the basis of the article number and production date. The method of registration described above for added ingredients and internal return flows is also used in this process.

8. Storage of finished product
All finished product silos are given a ***unique code***. Where use is made of boxes they also are given a unique code. This may possibly be done by allocating a unique code to a group of boxes. When the production from a compound feed production run is complete then a record is made of in which finished product silo the production run has been stored. To do this a record is made of the article number and production date and this is linked to the unique code for the finished product silo. A summary is then maintained for each finished product silo of the batches of end feeds present (based on the FIFO principle). This summary also shows as standard which last three production runs were stored there before this one.

When ***storing production runs of finished product*** an attempt is made to match a production run as far as possible to the storage capacity. This means that production runs are stored such that:

- The number of production runs is a single finished product silo is as small as possible;
- Wherever possible a single production run is stored in a single storage location;

Empty reports for the finished product silos are made at least once per 3 months and are recorded. Boxes must be reported empty each time they are emptied. The empty report for boxes can also be done for a group of boxes as long as this group is unambiguously defined and coded. The date of reporting empty will be linked to the finished product silo or box number in question. However, if the silos are emptied more often than once per 3 months then an empty report will be made and recorded every time.

Random end product ***samples*** will be taken from the production runs. The samples will be kept for at least one month and will be labelled with the article number/production date and the date of sampling. Also specified on the label will be in which silo the production run is stored.

9. Bagging

Each bagging line is provided with a ***unique code***. During bagging a record is made of from which finished product the feed has been taken. Bagging is then recorded with the article number of the feed and the bagging date and time, linked to the specific bagging line. The article number and bagging date are recorded on the packaging label. At the Basic Level it is also possible for companies to provide the labels with a Best Before date from which the bagging date can be derived. At a later stage it will be possible to work out from the bagging date or the Best Before date from which finished product silo the bagging was done. Using the FIFO principle it can then be seen which production runs were being bagged at that moment.

10. Shipping and distribution

During shipment a record is made of on which date and from which silo and for which unique UBN number (or combination of customer number / delivery address) shipment is being made. The ***shipment silo number*** is recorded at the company. At a later stage it will be possible to work out from the code from which finished product silo the shipment was made. The Best Before date for the feed will be recorded on the bulk slip. Using the FIFO principle it can then be seen which production runs were being shipped at that moment. The vehicle registration of the carrier is also recorded during shipment.

5.3 Recommendations

The results of the practical inventory and the Tracking & Tracing systems model described lead to the following recommendations. These recommendations work as coordination for further implementation of Tracking & Tracing guidelines in the Dutch animal feed sector. The Product Board Animal Feed can use the following recommendations to determine policy with respect to the traceability of animal feed.

- *The basic tracking & tracing level is feasible for all compound feed companies;*
  More than 40% of locations currently achieve the basic level. The basic level is feasible for companies for all locations by making minor changes. It is therefore realistic to expect that the relevant data requested for the basic level should be handed over by companies within the period of time set.

- *Communication path of T&T guidelines for increasing support within the sector;*
  Communication of the study results is important in order to increase support for the animal feed tracking & tracing guidelines drawn up in this study. In addition to increasing support, the purpose of communication is to bring about implementation of the proposed guidelines.

- *Current level of animal feed T&T equal to or better than foodstuff industry;*
  Comparative studies in the meat industry, AGF and foodstuff industry show that the performance of the compound feed companies which were examined for traceability are comparable or in some cases better.

- *Input for policy makers in the Ministry of Agriculture, Nature Conservancy and Fisheries;*
  The animal feed sector expects that within the foreseeable future stricter legislation on traceability will be drawn up by the government. This study provides the animal feed sector with a way to show the policy makers within the Ministry of Agriculture, Nature Conservancy and Fisheries that the sector has already taken on its responsibilities. The results of the study may also serve to provide any legislation to be drawn up with a number of ‘practical findings’.

- *Inclusion of basic guidelines in GMP+;*
  The guidelines drawn up in this study for animal feed tracking & tracing may if they have sufficient support be included in GMP+. The inclusion of the guidelines in an existing system may perhaps be a more efficient option than implementing an independent system for traceability requirements. Integration into GMP+ would also guarantee the check on compliance for the guidelines. An option for integration in GMP is to include the basic level in GMP+ and to include the guidelines at a higher level possibly in the longer term through a further focusing of GMP+.

- *The drawing up of a certification schedule for tracking & tracing animal feed guidelines.*
  A checking schedule will have to be drawn up for the checking on compliance on tracking & tracing guidelines. This schedule will have to provide sufficient guarantees of proper checking and possible certification of the guidelines.

- *Expansion of Tracking & Tracing from link perspective to chain perspective;*
  The focus of this study is Tracking & Tracing at link level. The implementation of total traceability in a production chain goes further than just company level. It is therefore important to examine the results of this study further in the chain perspective. The co-operation among partners is important in this.

- *Increase attention to and integration of T&T in other links in the food chain;*
  Through this study and the implementation in practice of the guidelines which have been drawn up the compound feed sector can show that tracking & tracing is well organised. It is important for total traceability in the chain to integrate or harmonise the guidelines for the animal feed sector with initiatives relating to links in the chain before and after the animal feed companies.

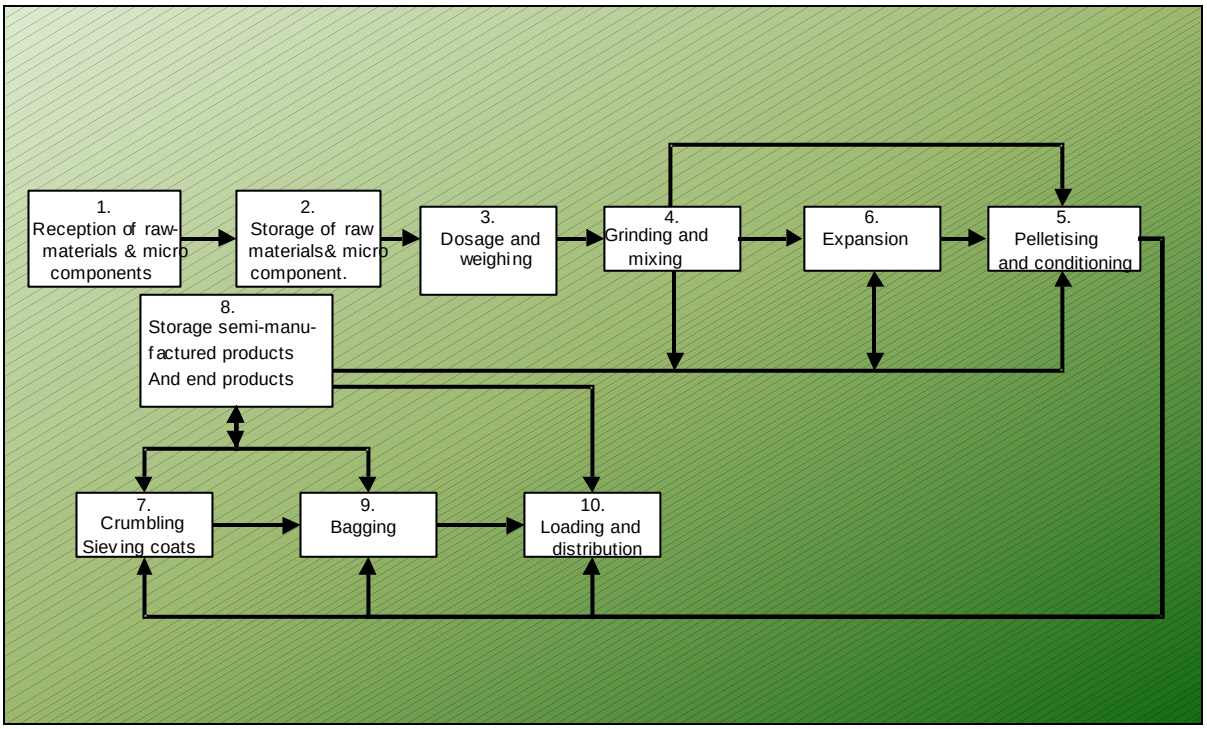
- *Drawing up a protocol for recall management in the animal feed sector.*
  In this study tracking & tracing was examined at link level. Part of this was a recall procedure at company level. From the chain perspective, however, recall management for the total chain is an important issue in tracking & tracing. In order to be able to make information available quickly and efficiently to the right people a protocol for recall management in the animal feed sector is therefore advisable.

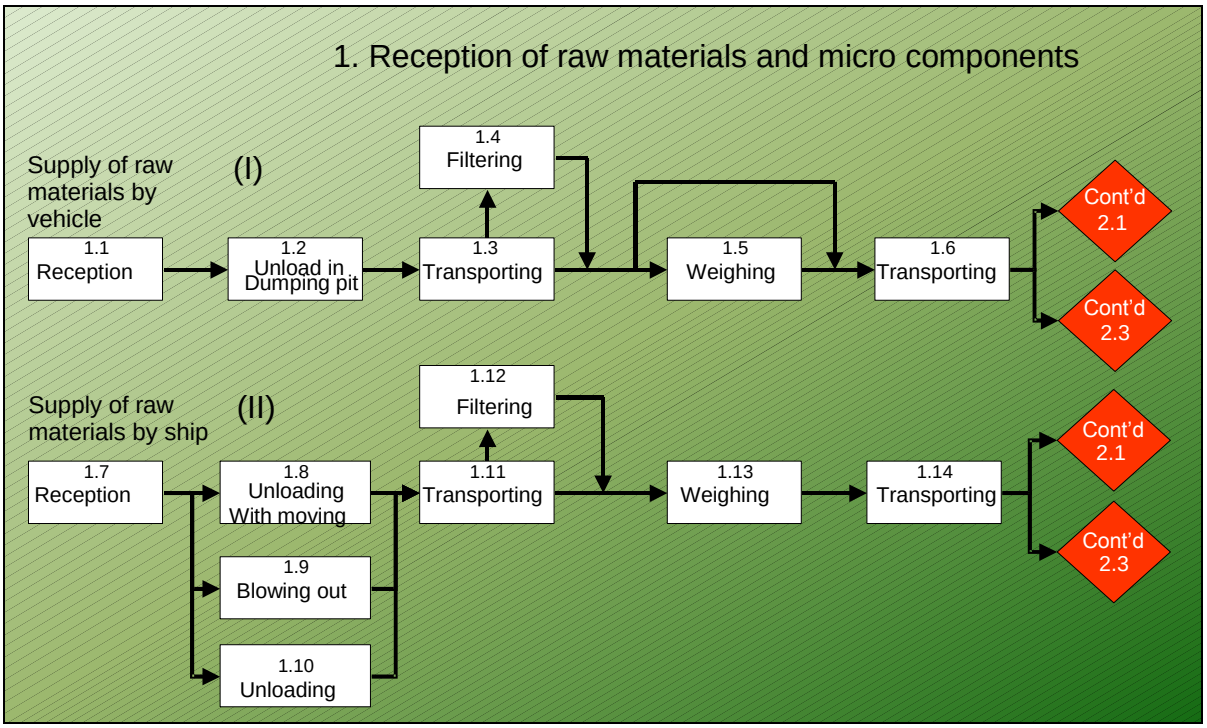
Appendix I List of definitions

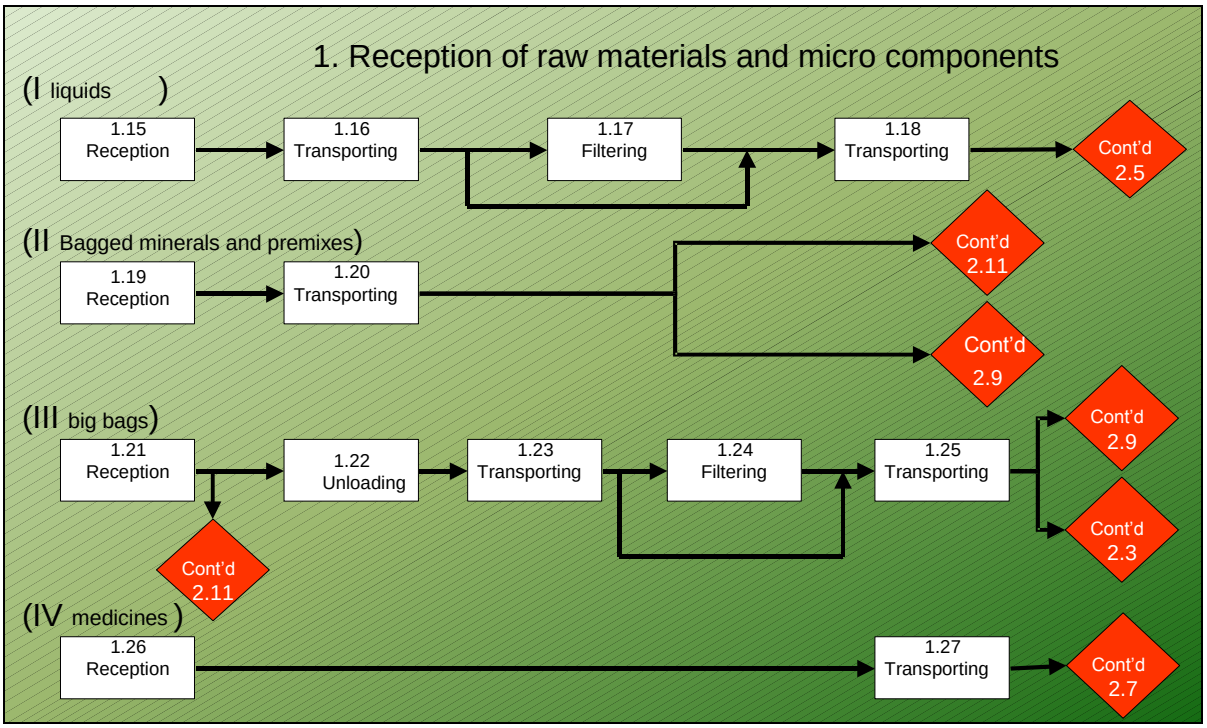
Term	Definition
Article number	The article number is the general number which a company uses for a product which complies with certain specifications which were defined in advance by the company. (For example a type of grain with certain specifications.) The article number provides general information on a certain product. Specific information about that product is linked to a batch number.
Contamination	Unintentional unavoidable contact of ingredients coming from other batches of raw materials with a specific batch of raw materials.
Segregation	The setting up and organisation of physically separated product flows throughout the whole animal feed chain.
Tracing & Tracking	*Tracking & Tracing* provides insight into the location of the goods at a particular moment The Tracking &Tracing system creates a set of historical data using established identification so that it is possible to follow raw materials, semi-manufactured products and end products. *Tracking* is the determination of the location of a given batch at a period of time to be determined. *Tracing* is the determination of the history of raw materials, semi-manufactured and end products during their passage through the chain.
Batch number	The batch number links specific information on a particular batch of product to the batch in question. This is more specific than the general information from the article number. An article number gives access to, for example, the information that it is a maize product with a particular feed value while the batch number also provides information on the size of the batch and what, for example, the quality aspects are for the batch in question.
Production run number	The production run number is a number which is created before the start of the production of a batch of compound feed. The use of raw materials is linked to the production run number. A particular recipe is also linked to the production run number and the physical progress through the compound feed factory is recorded.
Recall	A recall regulates the calling back of a specified quantity of product. This refers to the process of informing customers and the organisation of the recall action for the products.
Recall in the first instance	The recall in the first instance regulates the recall or blocking of a specific batch in which a problem has occurred. This may be as a result of a complaint or of an inspection of semi-manufactured and end products.
Recall in the second instance	The recall in the second instance regulates the recall of a specific amount of product in which a particular problem has occurred. The amount is determined using downstream tracing after upstream tracing.

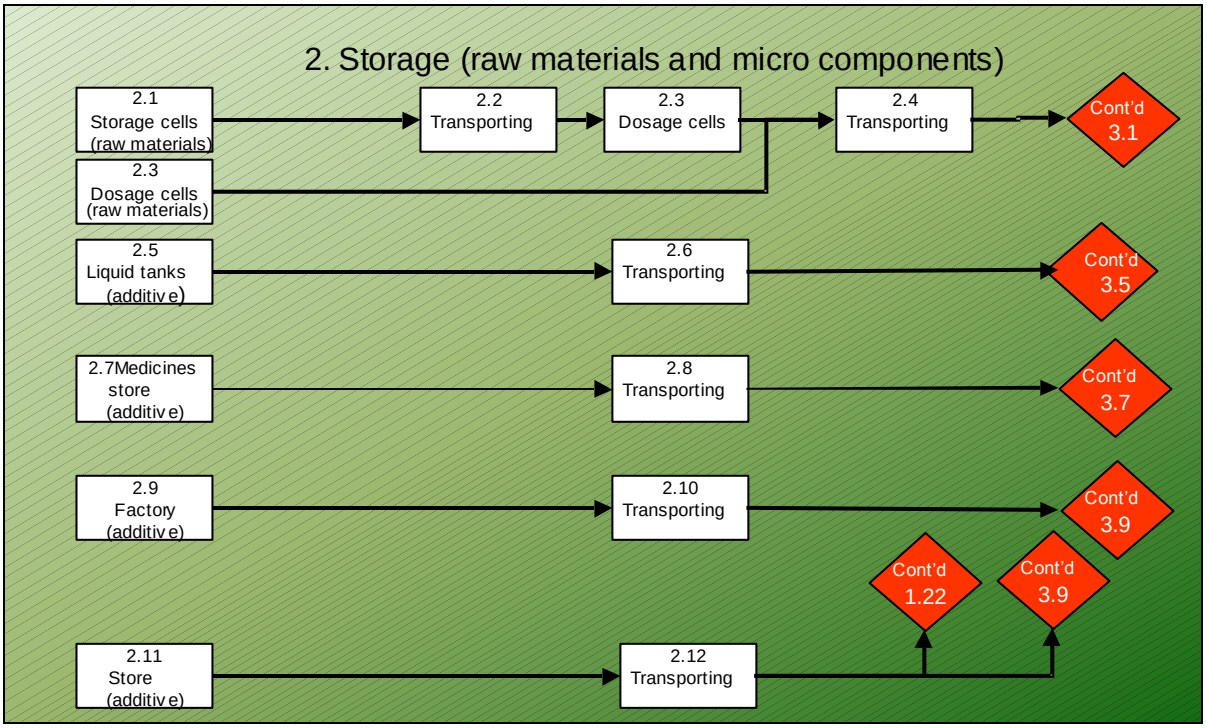
Downstream tracing	Downstream tracing: the determination of the history of the product from raw material via semi-manufactured products to end products. This process is used in the event of late signalling of problems in raw materials or semi-manufactured products, to determine in which batches of end products the problems may occur. Using downstream tracing, the size of the recall in the second instance can be determined.
Upstream tracing	Upstream tracing: the determination of the history of the specific product from end product via semi-manufactured products to raw materials. This process is specifically used to trace the source of a problem following a complaint from the market or deviations found during the inspection of semi-manufactured products or end products. Is used to find the source of the problem or a faulty product.

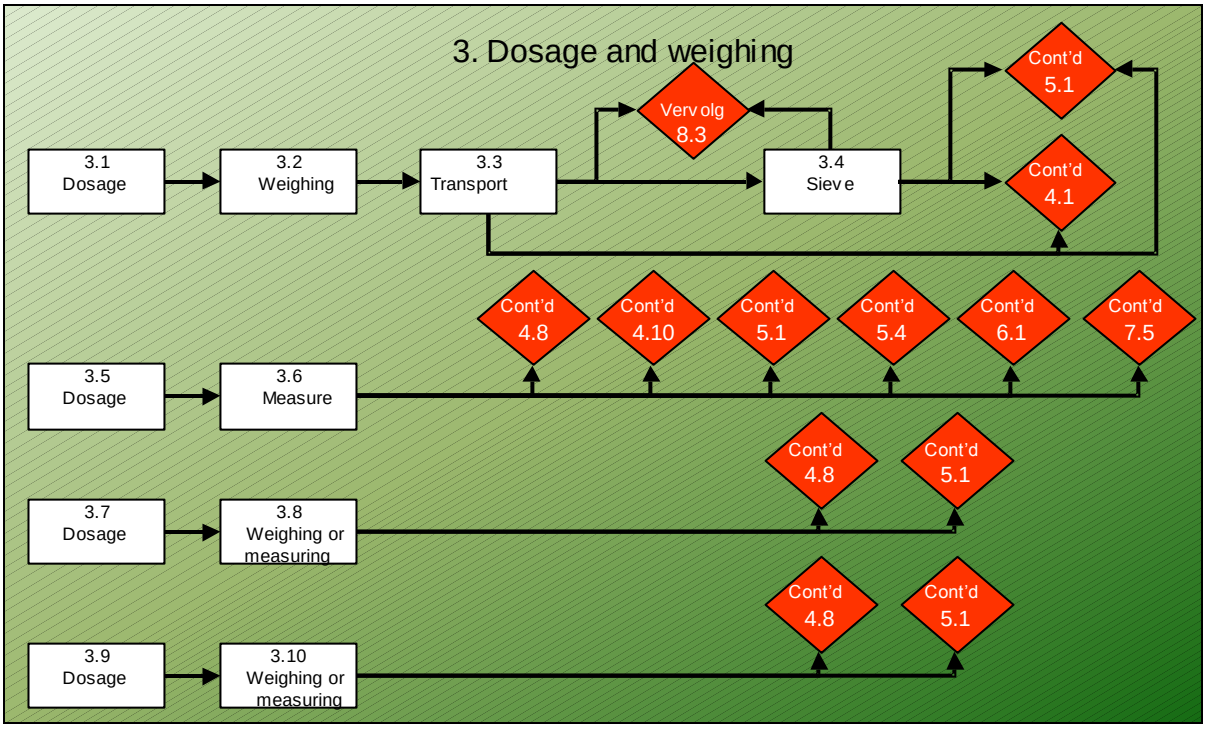
Appendix II Compound feed process diagrams

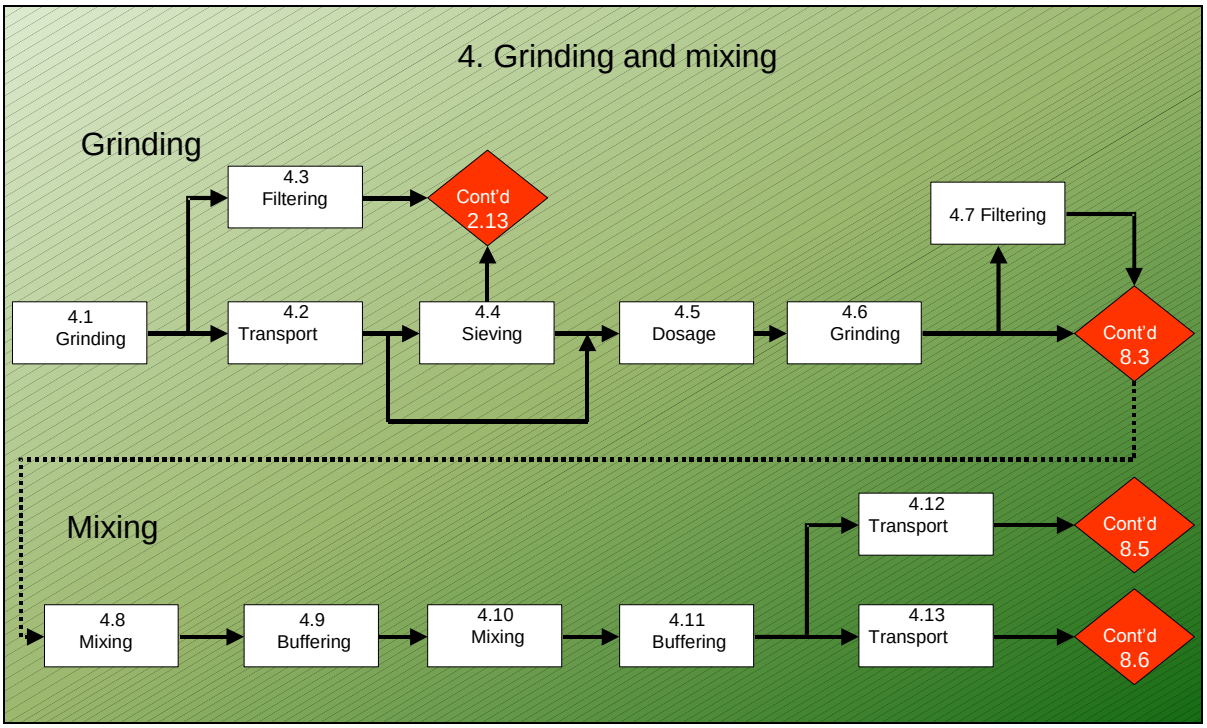


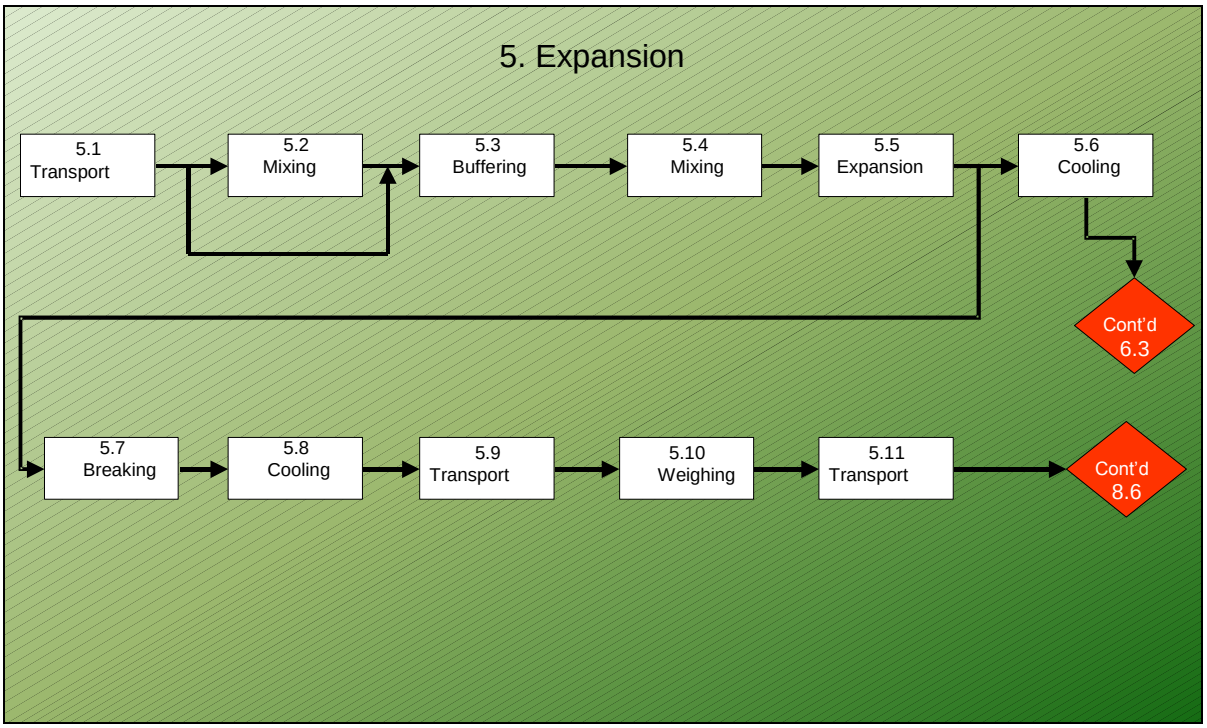

1. Reception of raw materials and micro components
Supply of raw materials by vehicle
(I)
1.1 Reception
1.2 Unload in Dumping pit
1.3 Transporting
1.4 Filtering
1.5 Weighing
1.6 Transporting
Cont'd 2.1
Cont'd 2.3
Supply of raw materials by ship
(II)
1.7 Reception
1.8 Unloading With moving
1.9 Blowing out
1.10 Unloading
1.11 Transporting
1.12 Filtering
1.13 Weighing
1.14 Transporting
Cont'd 2.1
Cont'd 2.3

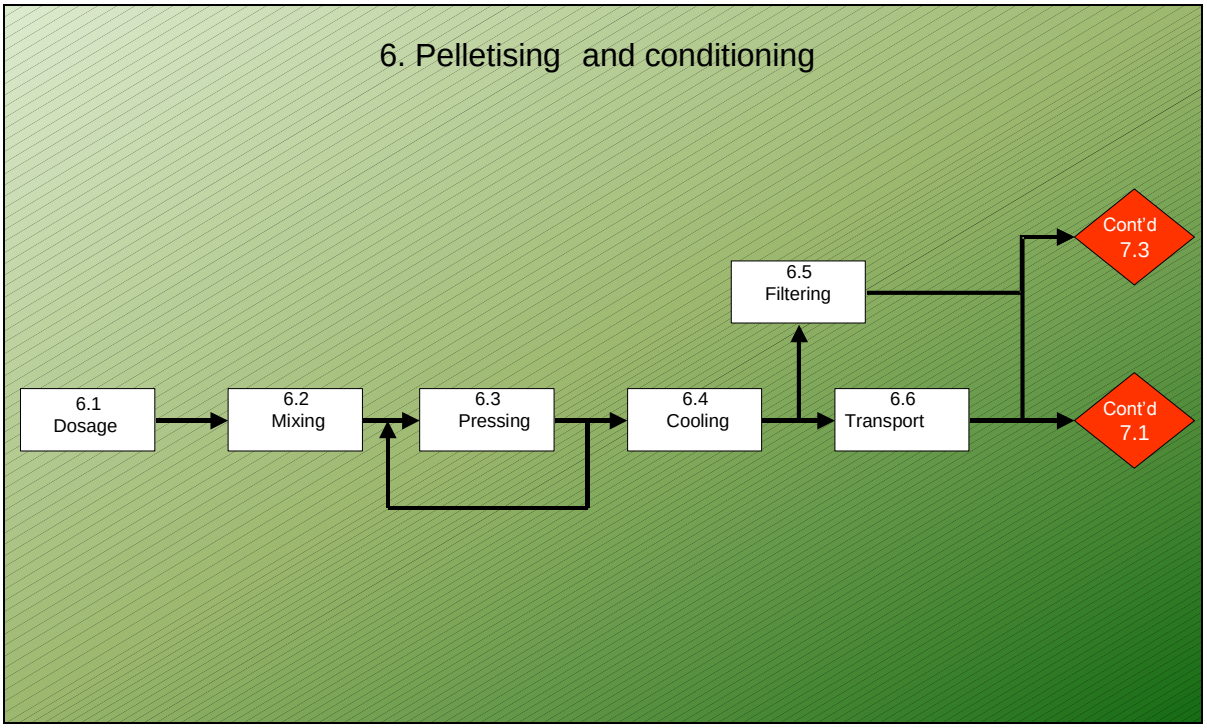

1. Reception of raw materials and micro components
(I liquids)
1.15 Reception
1.16 Transporting
1.17 Filtering
1.18 Transporting
Cont'd 2.5
(II Bagged minerals and premixes)
1.19 Reception
1.20 Transporting
Cont'd 2.11
Cont'd 2.9
(III big bags)
1.21 Reception
1.22 Unloading
1.23 Transporting
1.24 Filtering
1.25 Transporting
Cont'd 2.9
Cont'd 2.3
Cont'd 2.11
(IV medicines)
1.26 Reception
1.27 Transporting
Cont'd 2.7

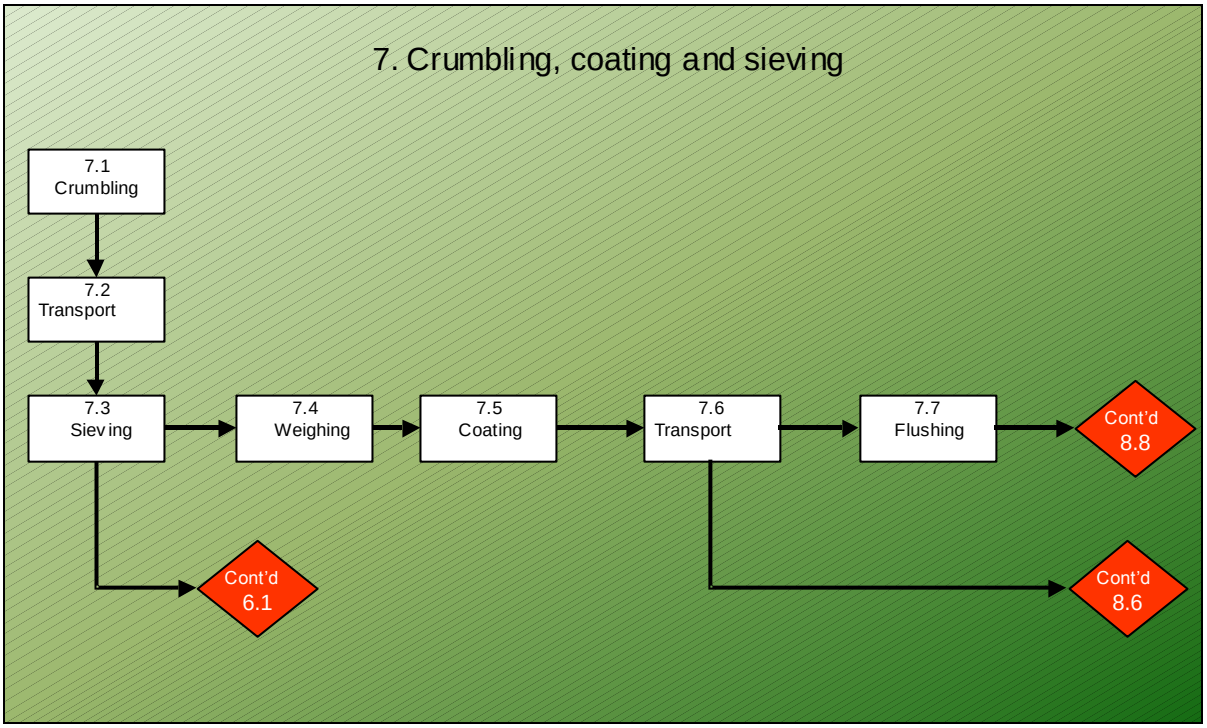

2. Storage (raw materials and micro components)
2.1 Storage cells (raw materials)
2.2 Transporting
2.3 Dosage cells
2.4 Transporting
Cont'd 3.1
2.3 Dosage cells (raw materials)
2.5 Liquid tanks (additive)
2.6 Transporting
Cont'd 3.5
2.7Medicines store (additive)
2.8 Transporting
Cont'd 3.7
2.9 Factory (additive)
2.10 Transporting
Cont'd 3.9
Cont'd 1.22
Cont'd 3.9
2.11 Store (additive)
2.12 Transporting

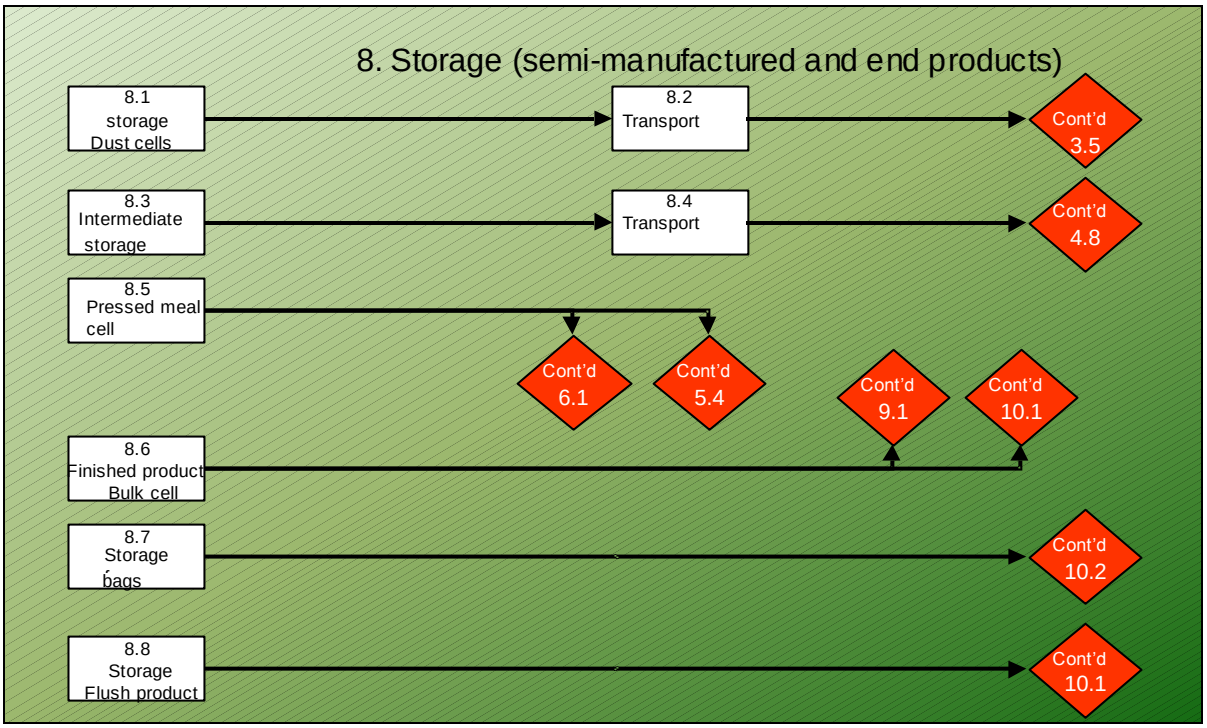

3. Dosage and weighing
3.1 Dosage
3.2 Weighing
3.3 Transport
Verv olg 8.3
3.4 Siev e
Cont'd 5.1
Cont'd 4.1
3.5 Dosage
3.6 Measure
Cont'd 4.8
Cont'd 4.10
Cont'd 5.1
Cont'd 5.4
Cont'd 6.1
Cont'd 7.5
3.7 Dosage
3.8 Weighing or measuring
Cont'd 4.8
Cont'd 5.1
3.9 Dosage
3.10 Weighing or measuring
Cont'd 4.8
Cont'd 5.1

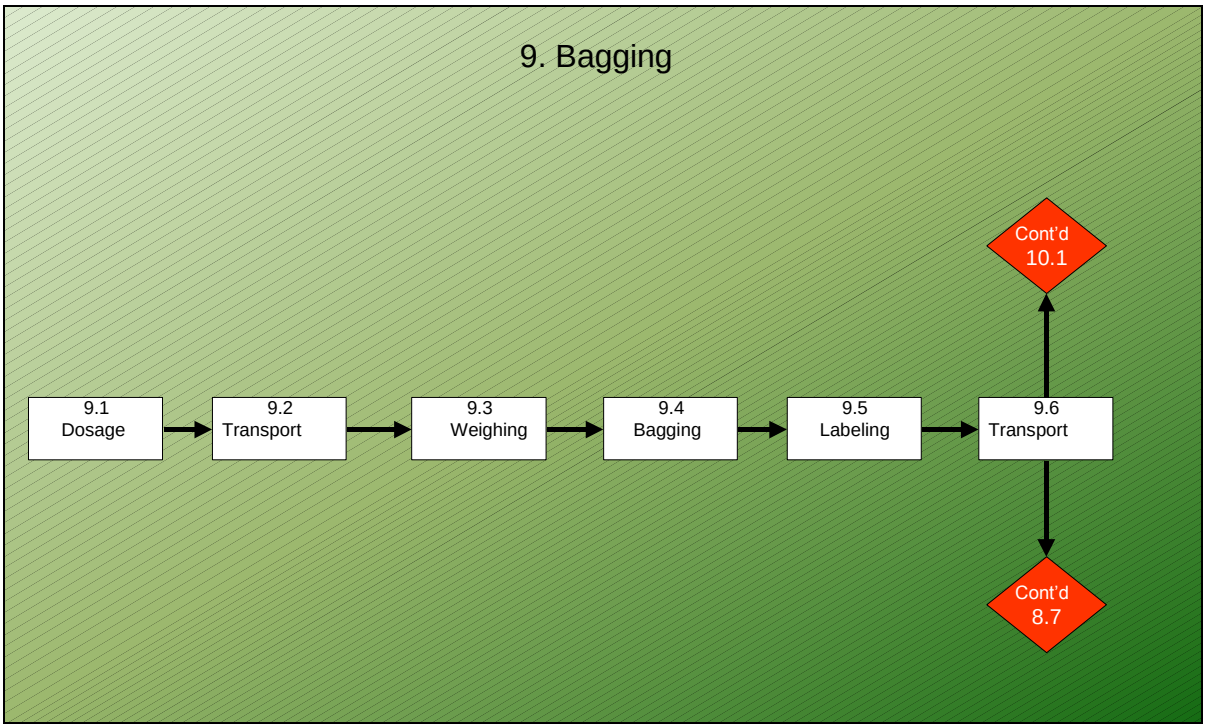

4. Grinding and mixing
Grinding
4.1 Grinding
4.2 Transport
4.3 Filtering
Cont'd 2.13
4.4 Sieving
4.5 Dosage
4.6 Grinding
4.7 Filtering
Cont'd 8.3
Mixing
4.8 Mixing
4.9 Buffering
4.10 Mixing
4.11 Buffering
4.12 Transport
Cont'd 8.5
4.13 Transport
Cont'd 8.6

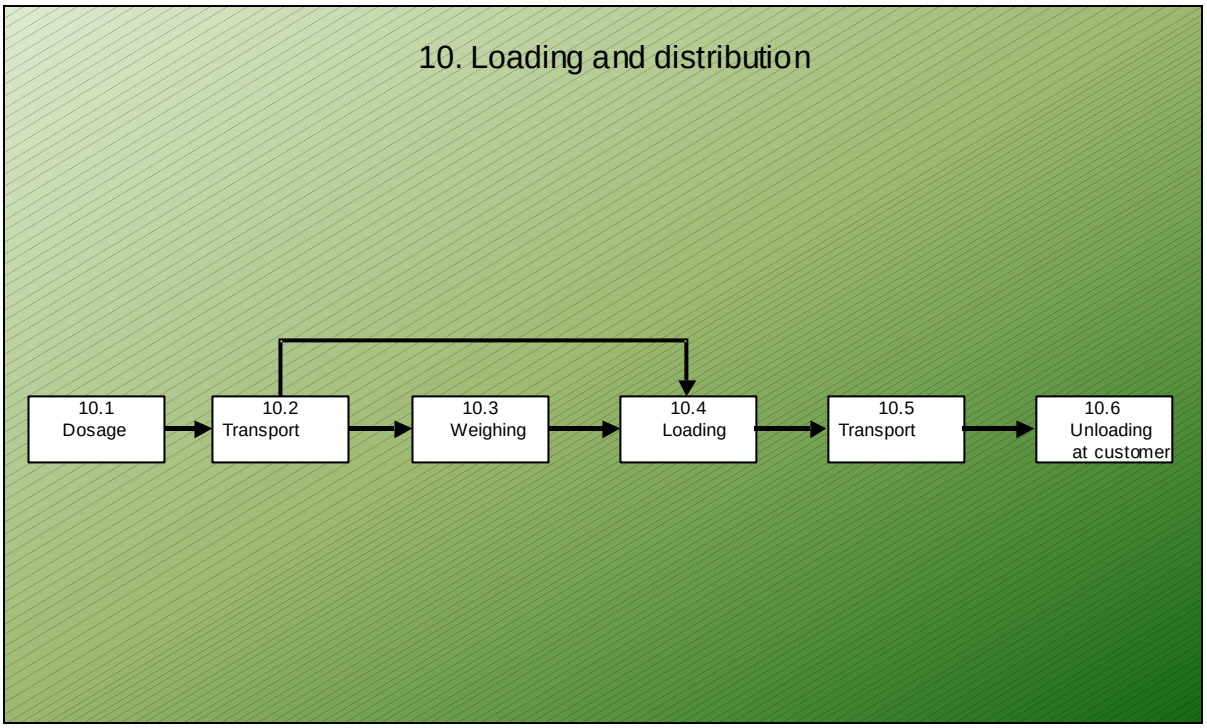

5. Expansion
5.1 Transport
5.2 Mixing
5.3 Buffering
5.4 Mixing
5.5 Expansion
5.6 Cooling
Cont'd 6.3
5.7 Breaking
5.8 Cooling
5.9 Transport
5.10 Weighing
5.11 Transport
Cont'd 8.6


6. Pelletising and conditioning
6.1 Dosage
6.2 Mixing
6.3 Pressing
6.4 Cooling
6.5 Filtering
6.6 Transport
Cont'd 7.3
Cont'd 7.1


7. Crumbling, coating and sieving
7.1 Crumbling
7.2 Transport
7.3 Sieving
7.4 Weighing
7.5 Coating
7.6 Transport
7.7 Flushing
Cont'd 8.8
Cont'd 6.1
Cont'd 8.6


8. Storage (semi-manufactured and end products)
8.1 storage Dust cells
8.2 Transport
Cont'd 3.5
8.3 Intermediate storage
8.4 Transport
Cont'd 4.8
8.5 Pressed meal cell
Cont'd 6.1
Cont'd 5.4
Cont'd 9.1
Cont'd 10.1
8.6 Finished product Bulk cell
8.7 Storage bags
Cont'd 10.2
8.8 Storage Flush product
Cont'd 10.1


9. Bagging
9.1
Dosage
9.2
Transport
9.3
Weighing
9.4
Bagging
9.5
Labeling
9.6
Transport
Cont'd
10.1
Cont'd
8.7


10. Loading and distribution
10.1
Dosage
10.2
Transport
10.3
Weighing
10.4
Loading
10.5
Transport
10.6
Unloading
at customer

Appendix III The ITI model

This appendix shows the descriptions of the terms in figure 27.

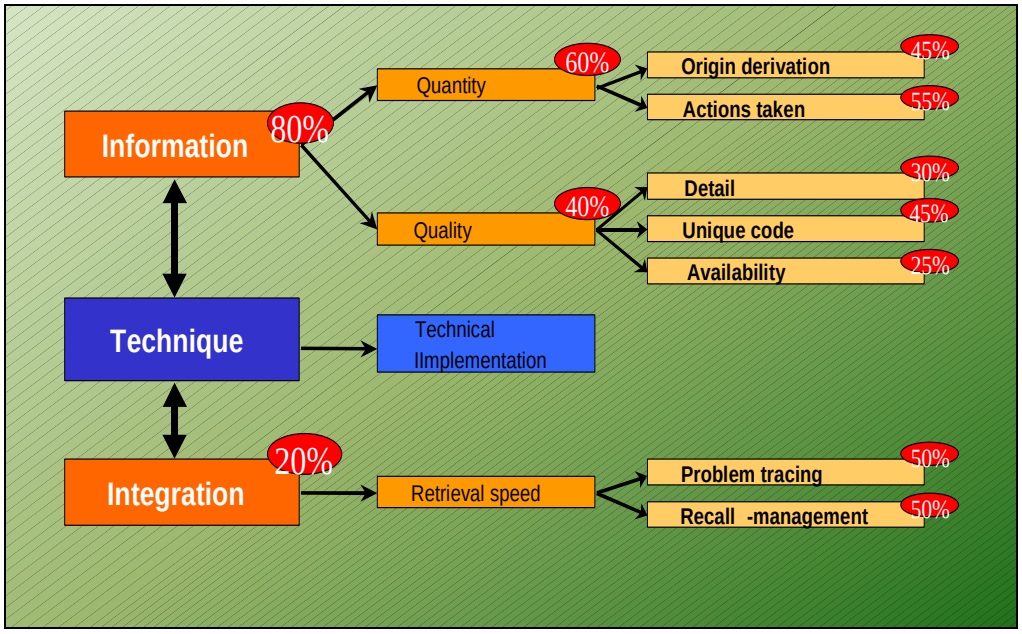


Figure 27: ITI model

Term	Definition
Information	The information available at the company on raw materials and additives, reception, storage, production and distribution processes and feeds.
Amount of information	Part of the term information The amount of information available on the raw materials and additives used and of the processes used for reception, storage, production and distribution and of the feeds produced.
Origin derivation	Part of the term amount of information Being able to derive the origin by way of information of the raw materials, additives, semi-manufactured products and produced feeds used.
Actions carried out	Part of the term amount of information The recording of data relating to the actions carried out during reception, storage, production and distribution processes and control data.
Information quality	Part of the term information The amount of detail and the availability of the information and the uniqueness of the coding used.
Detail	Part of the term information quality This addresses the question of how specifically the recorded information within the company can be linked to a specific batch product.

Uniqueness of coding	Part of the term information quality The company internal coding for production lines, storage areas, raw materials and additives, semi-manufactured and end products.
Availability	Part of the term information quality The information available to the company or the partners in the chain if necessary.
Technique	The technique used to make traceability possible.
Technical implementation	Part of the term technique The way in which the traceability system is implemented.
Integration	The harmonisation of the product and process information between links in the chain.
Retrieval speed	Part of the term integration The detail level of problem tracing and the speed of retrieval of required information in the event of a recall
Problem tracing	Part of the term retrieval speed Being able to trace a problem on the basis of a complaint where the records serve as a basis for finding out what the problem is.
Recall management	Part of the term retrieval speed Being able to trace customers who have received a problem batch and customers who have received batches with raw materials equal to those in the problem batches.

Appendix IV Guidelines on the traceability of animal feeds

B = Basic level
All traceability records must be kept for 7 years.

Animal Feed Traceability Guidelines – BASIC LEVEL
1. Reception of raw materials (macro and micro components)
• Record of the quantity and type of raw material
• Record of the actual delivery date for raw material; if there is a planned delivery date then a correction should be made for the actual delivery date if this is different (authorisation needed).
• Record of the time of delivery (if more than one batch of the same raw material will be delivered per day)
• Record of the name and address data for the supplier (name, address, town and telephone)
• Record of the purchase contract number
• Record of the method of transport (ship, road transport, rail)
• Record of the control data for the delivery slip with the weighing result
• Record of the control data for the delivery specifications with the purchasing specifications
• Demonstrable separation of suspect batches of raw material and a record of all deviations observed
• Registration of the name and address data for the carrier
• Record of received external returns, record of the type (type of animal) and the amount of feed
• The allocation of an internal batch number to the received batch of raw materials or the combination of the batch data of a batch of raw material (supplier, quantity, type, delivery date and time) make the batch identification unique.
• Record of the date of the silo empty measurement (minimum 1 per 3 months)
• The taking of samples of *critical* raw materials which should be kept sealed, labelled and administered in the lab system.
• Record of the results of organoleptic checking of all received raw materials
• The period during which the raw materials samples may be used is equal to the shelf life of the feed (minimum 3 months).
2. Storage of raw materials (macro and micro components)
• The allocation of a unique code to every storage silo and storage tank.

Animal Feed Traceability Guidelines – BASIC LEVEL
• The allocation of the batch number of the raw material or the uniquely identified batch of raw material to the storage silo or storage tank (for example raw material batch number x is stored in silo A).
• The linking of the unique batch data in an external return to the storage silo or storage tank.
• Record of the turnover of raw materials to other silos
• Record of the storage and transport sequences (to prevent contamination)
• Record of observed complications during storage
3. Weighing and dosage
• The allocation of an article number per product per production date before the start of the (daily) production
• Record of dosage/weighing of raw materials from silo numbers (source) for particular production on a date (link to article number or production run number)
• Record of date and time of dosage and weighing
• Record of the allocation of raw materials use (which ones and the amount from which silo numbers) and production destination (article number or production run number)
• Record of actual dosage (in comparison to planned dosage on the basis of the formula/recipe)
4. Grinding and mixing
• The allocation of an article number to a grinding – mixing line (number) by the production date
• Record of dosage of the addition of other ingredients and the mixing in of internal return flows (what, from which silo and the quantity)
5. Conditioning and pelletising
• The allocation of an article number to a press line (number) by the production date
• Record of allocated dosage of other added ingredients and the mixing in of internal return flows (what, from which silo and the quantity)
6. Expansion
• The allocation of an article number to a production line (number) by production date
• Record of allocated dosage of other added ingredients and the mixing in of internal return flows (what, from which silo and the quantity)
7. Crumbling, coating and sieving
• The allocation of an article number to a production line (number) by production date

Animal Feed Traceability Guidelines – BASIC LEVEL
• Record of allocated dosage of other added ingredients and the mixing in of internal return flows (what, from which silo and the quantity)
8. Bagging
• Record of silo number by packaging line
• The labelling of the end product with article number and bagging date and/or specification of use-by date
9. Storage of finished product
• Record of article number / production date by finished product cell (number)
• Record of date of silo empty measurement (minimum 1x per 3 months)
• Random samples should be taken from the production runs. These samples should be kept for at least 1 month and labelled such that a link can be made to the production date (Belgian legislation currently requires that samples are taken by production date and article number).
10. Distribution
• The recording of a loading silo number to customer number / delivery address (UBN)
• The recording of a loading silo number to the licence number of the truck
11. Throughout the business
• The company should be GMP worthy. Authorisation and responsibility is regulated within GMP.
• The necessary information – from customer to article number / production date – should be available within 12 hours (recall 1st instance)
• The necessary information – from customer to article number / production date to raw materials to article number / production date – should be available within 24 hours (recall 2nd instance)
• The retrieved data can be handed over in writing on paper within the time limit set
• The size of the 1st instance recall is based on the recall of product based on article number / production date on the basis of FIFO delivery of the finished product with the safety margin set for this. This margin should be set by the company on the basis of its own research.
• A recall simulation should be carried out within 12 months of the effective date of these guidelines. Thereafter the recall simulation should be repeated every two years and in the event of changes to the method of registration. The experience gained during this recall simulation should be recorded.

Animal Feed Traceability Guidelines – BASIC LEVEL

- The size of a 2nd instance recall is based on the recall of all article numbers with raw materials from the faulty article number / production date. This is done on the basis of FIFO for raw materials from the raw materials silos with the safety margin set for this purpose of 30%. A lower margin should be set by the company on the basis of its own research.

Appendix V Recall and problem tracing

A recall regulates the calling back of a specified quantity of product. This refers to the process of informing customers and the organisation of the recall action for the products. For making a recall a split may be made into a recall which is carried out as a result of a product with a problem from outside the company and a recall which occurs as a result of a product with a problem which is found within the company. In addition a distinction can be made between a 1st and 2nd instance recall.

Both situations are discussed using the following figures.

Problem discovered outside the compound feed company

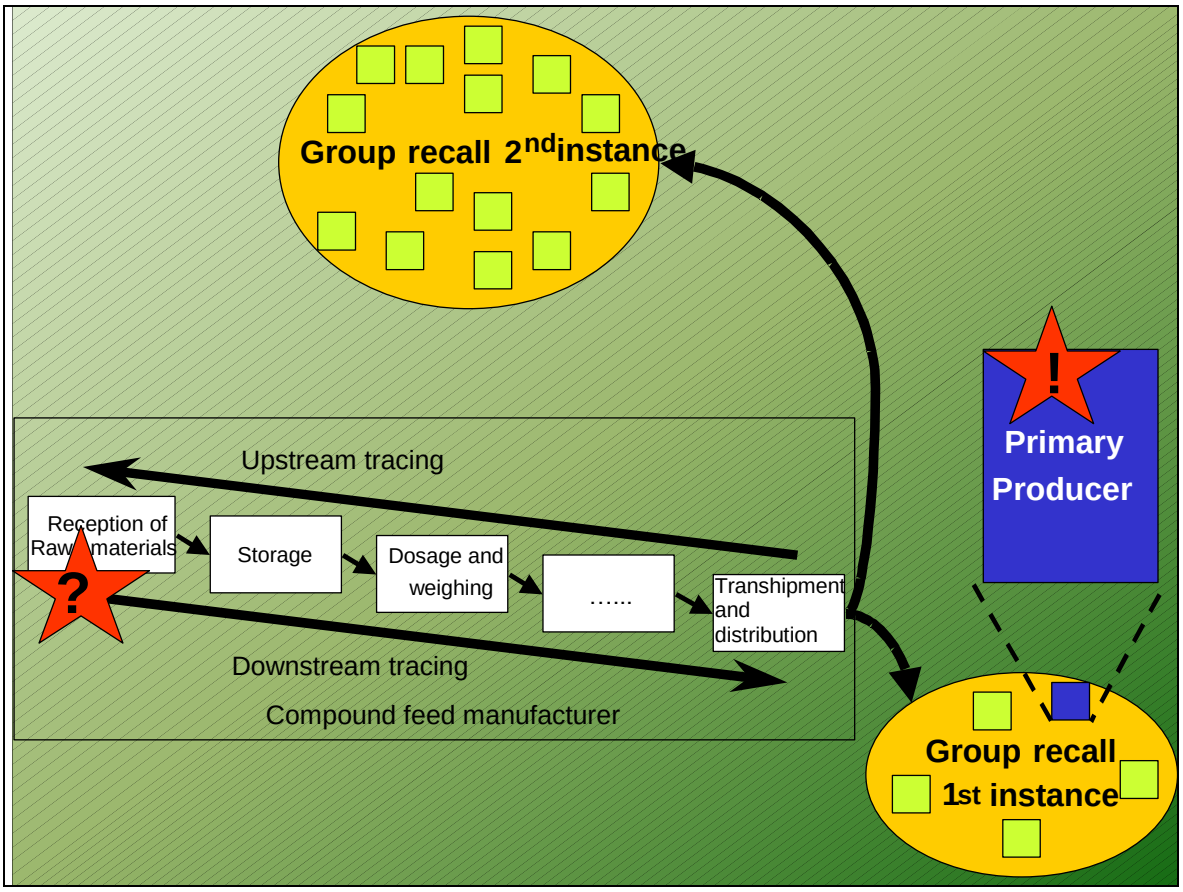


Figure 28: Recall with problem product outside own company

If a customer comes across a problem in a delivery of compound feed then the compound feed manufacturer may decide to proceed with a recall. Figure 28 shows this with the star with the exclamation mark. If the compound feed manufacturer takes action to recall all deliveries of compound feed to the factory from the batch of compound feed involved, then

this is called a 1st instance recall. Finding all the customers for that particular batch is called tracking. The manufacturer will often wish to know how the problem arose. Using upstream tracing an attempt will be made to find the source of the problem. Downstream tracing will be used to find which other batches of compound feed may also have such a problem.

The manufacturer may then decide on a 2nd instance recall. This takes place in the usual manner. The manufacturer will use tracking to find the clients for the batches in question and then have them returned.

Problem discovered inside the compound feed company
There is a different situation when a product is found with a problem when it occurs within the company.

The first instance recall may also be a blockage and there only may need to be an internal recall. This is shown in figure 29. As may be seen from the figure the problem is discovered during the process …. And action will be taken immediately. Using upstream tracing the manufacturer will make an attempt to find the source of the problem. Downstream tracing will be used to examine whether the problem may have occurred in other batches and, if this is the case, in which other batches of compound feed such a problem may have occurred. From that moment the manufacturer may again decide on a 2nd instance recall as for the first situation.

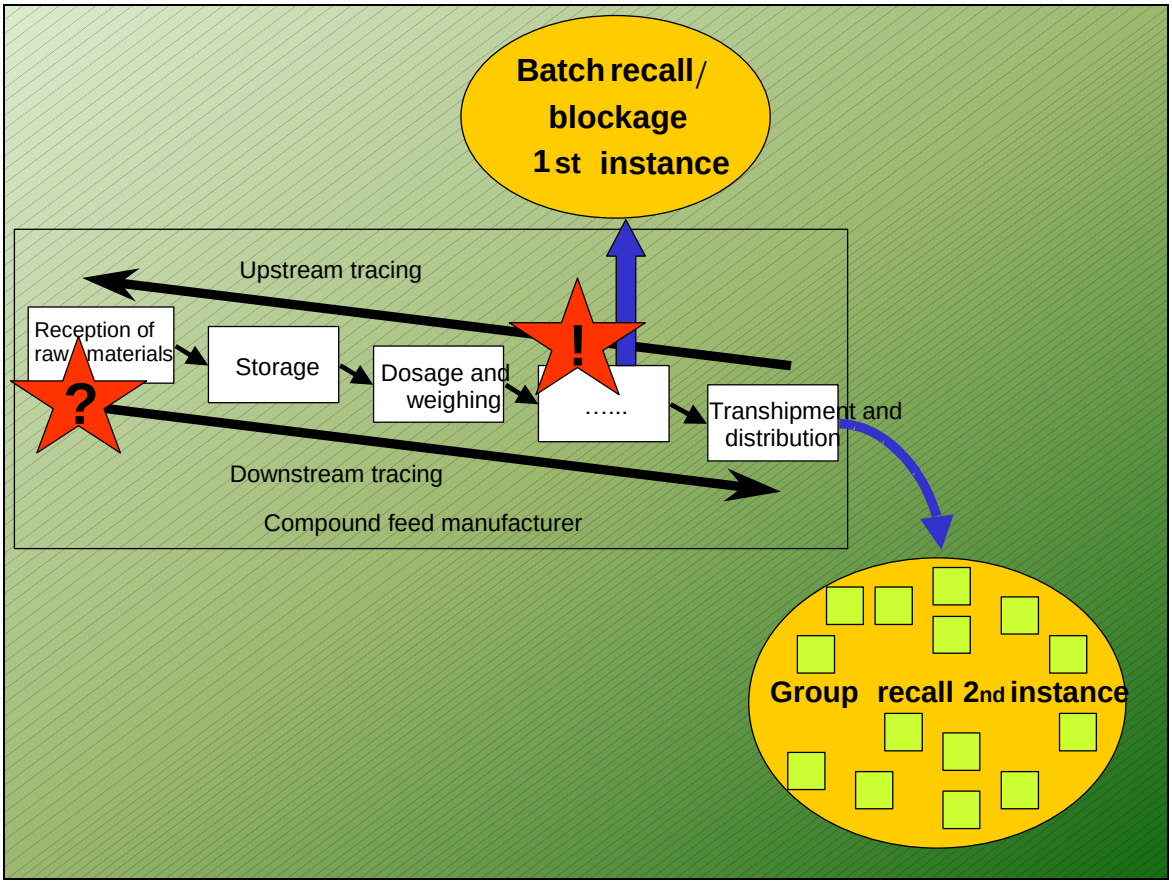


Figure 29: Recall with problem product inside own company