Guidance

S9.12 - How to prevent Feed Fraud

Version EN: 1 March 2021

GMP+ International

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1. Introduction

Fraud is an important source of risks that can affect the safety of food and feed. Also because fraud undermines the system that was particularly established to assure that safety. The feed sector, just like the food industry, acknowledges the necessity to focus on this issue and to act accordingly. With this Feed Fraud Information document, GMP+ International wants to contribute to that. The document is in line with the new integrity policy introduced by GMP+ International early 2015.

Definition of Feed Fraud
Feed fraud encompasses a wide range of ***deliberate fraudulent*** *acts with regard to feed*[1,2,3]. *The focus of this information document is the* ***intentional*** *and* ***economically motivated adulteration*** *(EMA). A variety of food fraud definitions have been published that can also be used for the definition of feed fraud. In general, this information document assumes the following definition:* ***the fraudulent addition of non-authentic substances or the fraudulent removal or replacement of authentic substances*** *without the knowledge of the buyer and for financial gain of the seller*[5].

Why this information document?
The feed sector is faced with fraud in food and (raw materials for) feed. Fraud is a risk for the safety of people and animals. It undermines the assurance of that safety as well as the product integrity and the trust of chain partners and the consumer. The (safety) risk is significant, since the fraud is intended to go by unnoticed and fraudsters are not interested in (or aware of) the possible consequences. Their goal is to gain money or to reduce costs or losses.

This economically motivated adulteration has various consequences:

- The presence of (unknown) hazardous substances or products in the products produced by your company can adversely affect the safety of food and feed and harm the health of people and / or animals.
- The integrity of your products and the assurance of the safety thereof as well as the integrity of your company (and the entire sector) are at stake;
- The reputation and the image of and the confidence in your company (and the entire sector) can be adversely affected when you get involved with or are harmed by fraudulent activities.
- Economic consequences related to loss of clients, loss of sales, recalls of your product, claims from direct clients (livestock farmers) and other participants in the chains (such as slaughterhouses, retail companies), export restrictions, being delisted as supplier or participant in the chain, declining consumption of products of animal origin.

With this information document GMP+ International aims to increase awareness of the aforementioned consequences and to support the GMP+ certified companies with attention for and action of feed fraud.
The stakeholders of GMP+ International want to offer GMP+ certified companies the opportunity to establish and improve their own integrity level. For that reason, GMP+ International developedaGMP+ Information document together with them, to fight against feed fraud. In line with the values of GMP+ International Feed Support Products the information document needs to be:

- independent and science based. This was realized by means of the involvement of Food authenticity professor Saskia van Ruth of the Wageningen UR/ RIKILT;
- be practical. This was realized by means of participation of field experts from the feed industry in the development of the information document;
- be linked to the food industry. This was realized by using the SSAFE tool as a basis for the development of this information document (for more information: *http://www.ssafe-food.org/our-projects/*).

Legal framework
In general terms feed fraud is addressed in regulation (EC) 178/2002 (General Food Law). In this regulation animal feed destined for animals producing products of animal origin destined for human consumption is included. The General Food Law aims at the protection of the interests of consumers and provides a basis for consumers to make informed choices in relation to the foods they consume. The General Food Law aims to prevent:

- Fraudulent or deceptive practices;
- The adulteration of food;
- Any other practice which may mislead the consumer.

In Regulation 767/2009 feed fraud is also addressed in general terms. The labeling and the presentation of feed should not mislead the user.

Feed fraud in relation to feed safety
In case of an incident, the *cause* of the incident needs to be taken into consideration. Feed safety focuses on the **unintentional** contamination of feed by known products, organisms, mishandling, or processing. Feed fraud is different, since it is an **intentional** act perpetrated for economic gain. Feed fraud also differs from feed safety, since the types of adulterants can be unconventional and may only become known, once they are analyzed in a targeted manner. Feed Fraud prevention and Feed Safety Assurance are much alike. In both cases, a lack of risks can result in risks for the health of people and animals.[3]

Feed Safety Assurance identifies risks of hazards, classifying these risks and enforcing control measures to limit these risks and monitors the result of the risk control – conformity is key here.

Controlling feed fraud identifies the vulnerability to fraud and is supplemented with a fraud control plan containing control measures. The focus is on the deviation from standard practice/nonconformity.

Controlling feed fraud requires a different approach than controlling feed safety, feed quality and feed defence. As shown in image 1, incidents regarding feed quality and feed safety are unintentional, since the feed manufacturer has no reasons to create these incidents. And there isn't any criminal committing this act. Feed defence is the protection of feed against ideologically driven contamination or adulteration with organic, chemical, physical or radiological agents. Feed fraud is an intentional act, with financial gain as a motivation.[7]

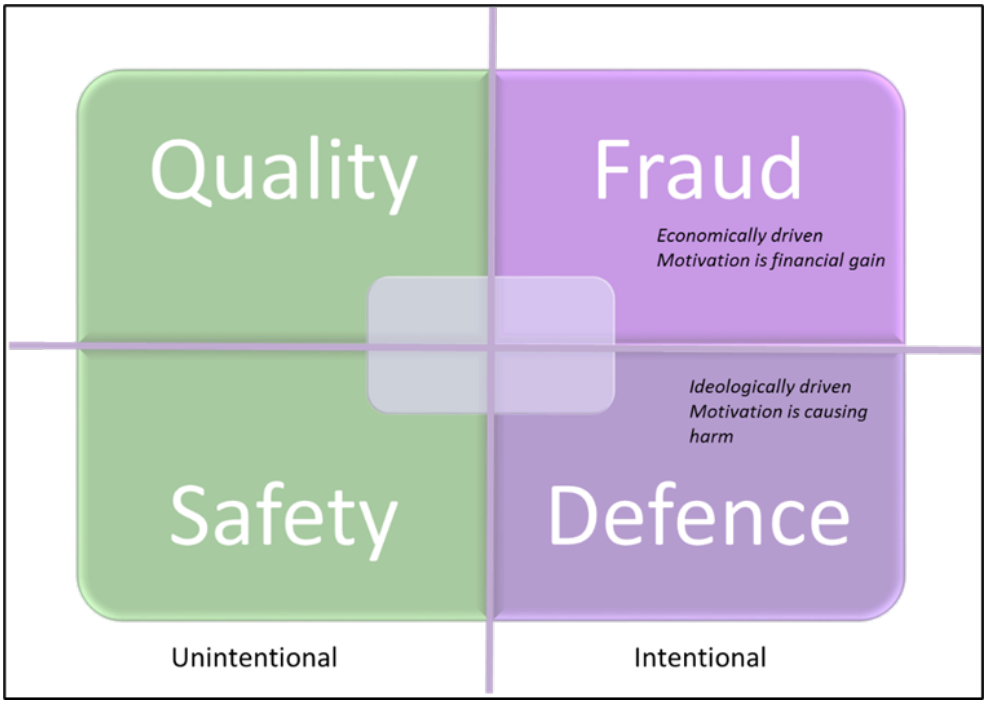

Figure 1. The feed protection risk matrix[7]

Although the approach is different, a management system for feed safety, such as HACCP, could help companies manage both risks related to fraud and feed safety into one system.

A suitable approach for fraud control in the food sector is the VACCP (**V**ulnerability **A**ssessment **C**ritical **C**ontrol **P**oints) system. As a follow-up to this information document, a feed VACCP system can be developed based on experiences with this and on feedback to this information document.

We should keep in mind that controlling feed fraud is not new. The *GMP+ FC scheme* describes items with regard to feed safety, that partly or entirely fall within the scope of feed fraud, but that, in the past, were not or not entirely classified as feed fraud. That qualification is now getting more attention due to the increased focus on the battle against fraud with (raw materials for) food and feed.

Examples are:

- Incorrect labelling of all product related documents (contracts, documents accompanying delivered products and product labels).
- Inclusion of mineral oils and melamine as a hazard in the GMP+ risk assessments and TS1.5 Specific feed safety limits.
- Incorrect use of the GMP+ logo.

Development of this information document
During the development of this information document, science has been the independent basis to identify the most important risks for fraud in the feed sector. Therefor GMP+

International has set up a working group with representatives and experts of the different parts of the feed chain. With the support of food authenticity professor Saskia van Ruth Wageningen UR a work shop was scheduled. Commissioned by the Global Food Safety Initiative (GFSI) and in collaboration with SSAFE, professor Saskia van Ruth of the Wageningen UR, in collaboration with the Free University of Amsterdam, developed *the food fraud vulnerability assessment tool (SSAFE)*. The scope of this tool is fraud in the food chain and the internal organization with regard to the fraud controls. This tool has been used as the basis for the workshop. Goal of this workshop was to determine what the most important risks are for fraud in the feed chain [1].

This has resulted in a list of the most important fraud risks. This is a starting point for companies in the feed sector and should be a trigger to further study the possible occurrence of feed fraud, its effects, possible controls and consideration if there are more risks involved.

1. Intercompany fraud and counterfeiting, are not within the scope of this information document.

2. What is feed fraud?

Feed fraud encompasses a wide range of deliberate fraudulent acts to with regard to feed[1,2,3]. The focus of this information document is the intentional and economically motivated adulteration (EMA) of feed. A variety of food fraud definitions have been published that can also be used as a definition of feed fraud. In In general, the definition covers the fraudulent addition of non-authentic substances or removal or replacement of authentic substances without the purchaser's knowledge for economic gain of the seller.[5] This covers the following types of feed fraud [4]:

- **Replacement by:**
  - **Dilution** is the process of fraudulently mixing a product of high value with product of lower value.
  - **Substitution** is the process of fraudulently replacing a product of high value with another product, or part of the product, of lower value.
- **Concealment** is the process of fraudulently hiding the low quality of a product.
- **Mislabeling** is the process of placing false claims or information on packaging or product documents.
- **Unapproved addition** is the process of adding unknown and undeclared substances that are not approved for addition to products, to improve the quality thereof.

Table 1. sums up a number of feed fraud cases.

Substitution	
Sunflower oil diluted with mineral oil in Ukraine	*Sunflower article*
Crude sunflower diluted with refined poultry oil in Ukraine (EWS GMP+)	*Sunflower poultry oil EWS 2015.11.17*
Animal fat diluted with technical fat in Belgium	*article* *article*
Substitution of fish meal with feather meal	*MANCP Multi-year Annual Control Plan Netherlands, annual report 2013*
Concealment	
Absence of L-lysine in feed additives	*RASFF 2011.1184*
Absence of choline chloride	*RASFF 2011.0727*
Selling first production start-up product with a low quality as normal product	
Mislabeling	
False declaration of geographic, species, botanical or varietal origin: e.g. origin unclear of fish meal declared as from Latvia	*RASFF 2015.0489*
Technical casein labelled as feed-grade casein	*RASFF 2007.CRV*
Unauthorized use of specific quality certificate / logo (e.g. GMP+ logo) but not produced according to these quality standard	*Newsletter 2015-01-29*
Improper health certificate fish meal	*RASFF 2012.BEH*

Substitution	
Unapproved addition	
Melamine added to soybean meal	*RASFF 2008.1480*
Addition of urea to yeasts	*RASFF 2016.0160*

3. The science behind feed fraud 4,8,9

Science is the independent factor to determine the most important risks for fraud in the feed sector.

Why do some people or companies commit feed fraud?

Scientists have found three main factors that determine a company's vulnerability to feed fraud, see image 2:

1. Opportunities
2. Motivations
3. Control measures

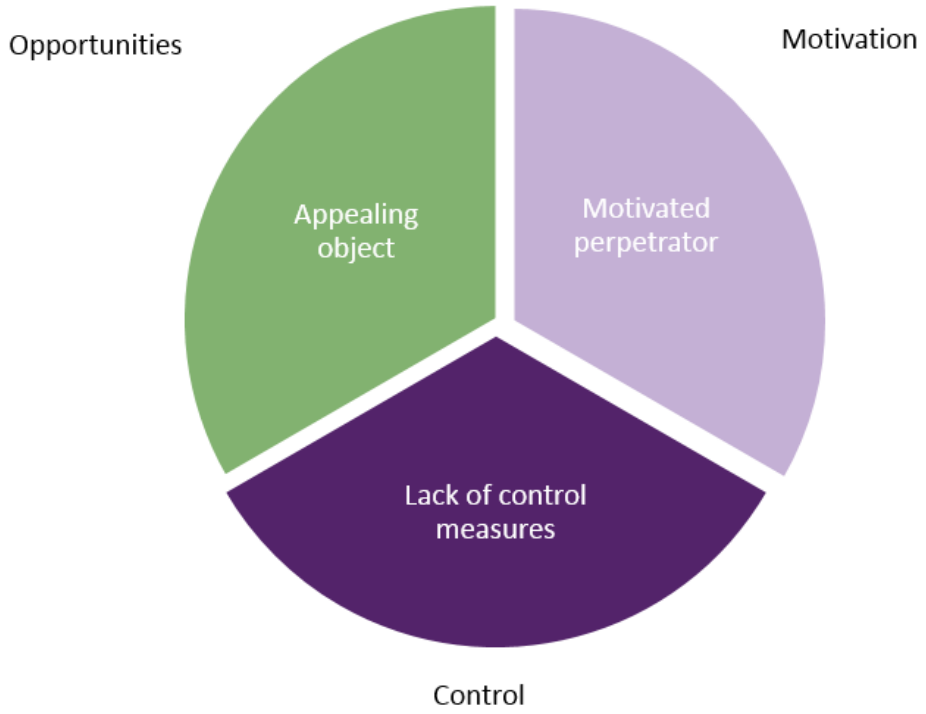

Figure 2: Elements that determine vulnerability to feed fraud

The relationship between opportunities, motivations, control measures and the feed fraud vulnerability are demonstrated in figure 3.

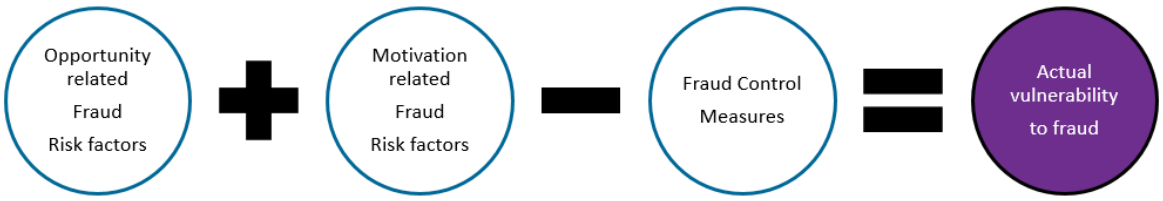

Figure 3: Fraud vulnerability

Ad 1 Opportunities
There must be a possibility or opportunity to commit fraud. Opportunities may be:

- Characteristics of the products: by nature of their composition, physical characteristics, qualities and geographical or production origin:
  - Easy adulteration of the composition of the product provides opportunities for potential offenders to commit fraud. The smaller the particles of the product the easier it is to adulterate, e.g. grounded products, powders, and liquid products.
  - If a product consists of multiple products/ingredients, there are more opportunities for committing fraud with this product compared to a product that consists of a whole (product).
  - Product quality: products that, for instance, exceed the contamination standards of which variants of technical grade are available, provide potential offenders with the opportunity to commit fraud.
- Access to the product: in order to commit fraud there needs to be access to the product. This can be at the production site but also during storage and transport or any other place in the feed chain.
- Detectability of the fraud: absence of a fraud control plan provides opportunities to commit fraud.
- Transparency of the feed chain: acomplex or non-transparent feed chain with no or limited information exchange provides potential offenders with the opportunity to commit fraud.

Ad 2. Motivations
The motivators for fraud can be:

- Economic:
  - Added value: a product with added value (composition, production method and / or origin) potential offenders can be motivated to commit fraud, because it greatly influences prices / payment. Examples of products with added value are high protein products, vitamins, amino acids, specific origin or production method (such as sustainable production).
  - Supply and demand: When the demand for the product exceeds the supply, such as due to export bans, this may motivate potential violators to commit fraud.
  - Financial need: a company or person can be motivated to commit fraud when financial strains exist between customer and client, when there are financial losses or when there are difficulties to comply to the financial needs**.**
- Culture:
  - Poverty / corruption: conditions in the country of origin or in a company can motivate offenders to commit fraud. A high corruption and poverty level increases the risk of fraud.
  - Common practice: in some cultures, fraud is generally accepted as common practice which can motivate the commitment of fraud.
- Personal traits / behavior: psychology defines certain personal traits and behavior as motivators for committing fraud.

Ad 3. Control plan

The control plan is designed to detect or control fraud and intervene in case of deviation. A clearly documented control plan outlines when, where and how to control fraudulent activities. A fraud control plan relates to:

- Own organization of the company: an organization should be prepared for handling fraud signals in terms of responsibilities and authorizations and the actual execution of the fraud control plan. The validation and verification of the fraud control plan should be included.
- Standards: when the common practice is known / standards are known (for instance certain levels of product), deviations can be determined. Deviations can be a signal of fraud. In practice there will be a combination of information that will trigger a signal for possible fraud.
- Fraud control measures[6] : appropriate control measures must be put in place to reduce the risks from feed fraud vulnerabilities. These control measures can include a monitoring plan, origin verification, specification management and supplier audits.

4. What is the impact of feed fraud?

With regard to fraud in the feed sector and how to control it, the first step is to increase awareness of the fact that your company could be the victim of fraud.

What effect could fraud have on my company?

It is advised for the companies' management to gain insight in and be aware of the possible impact of feed fraud. The applies to the following areas for instance:

- The presence of (unknown) hazardous substances or products in the products produced by your company can adversely affect the safety of food and feed and harm the health of people and / or animals.
- The integrity of your products and the assurance of the safety thereof as well as the integrity of your company (and the entire sector) are at stake;
- The reputation and the image of and the confidence in your company (and the entire sector) can be adversely affected when you get involved with or are harmed by fraudulent activities.
- Economic consequences related to loss of clients, loss of sales, recalls of your product, claims from direct clients (livestock farmers) and other participants in the chains (such as slaughterhouses, retail companies), export restrictions, being delisted as supplier or participant in the chain, declining consumption of products of animal origin.

Increasing awareness of the possible impact of feed fraud within a company begins at the management. The management must be aware of the possible impact of fraud on their (business)organization and of how feed fraud can be included the business policy. The management is responsible for defining and enforcing the business policy by means of feasible objectives and measures, by communicating these to the employees. For more practical information, click this *link*.

The level of impact is determined by the level of vulnerability for feed fraud. The next step is to determine where your company is vulnerable for feed fraud.

5. Where is my company vulnerable?

The products you receive originate from various chains, and therefore can vary in terms of vulnerability for fraud. Certain products are more vulnerable to feed fraud than others. The feed fraud vulnerability depends on the:

- the type of product;
- companies in the chain (e.g. culture, history of fraud, financial situation);
- chain characteristics (number of companies, complexity, transparency);
- level of the already existing fraud control plan within your own company.

Your company could be vulnerable to feed fraud throughout the feed chain.

Do you know where your company is vulnerable to feed fraud?

To answer this question, it is of crucial importance to have knowledge about:

- products in your product portfolio;
- chain of the products delivered to you;
- your own (business)organization.

To support you in answering this question and to gain knowledge of the above-mentioned subjects GMP+ International has set up a *questionnaire*. This questionnaire was designed in collaboration with experts from the feed industry and under the guidance of Food authenticity professor Van Ruth of the Wageningen UR/ RIKILT. It is advised to fill out the questionnaire with specialists of different disciplines within your organization (see *Appendix 1*).

Helpful tip:

If the product portfolio is extensive, then it may be helpful to make product groups or to prioritize the products. Start with products that for instance:

- represent the highest volume in the portfolio;
- originate from major or from important suppliers or producers;
- are expensive or have a specific added value;
- are used in animal feed for sensitive animals (e.g. young animals);
- are used in animal feed that is critical for the image of the company;

have been classified in a high risk group, using your own classification system

A filled-out questionnaire will result in a list of fraud sensitive products and companies. In addition, it will indicate where there's room for improvement with regard to fraud control.

The team of specialists should critically review this list in order to determine which fraud control measures should be implemented, in order to reduce vulnerability to feed fraud. In the next chapter suggestions are given for a fraud control plan.

Helpful tip:

With some adjustments you can also use the questionnaire for chain of the finished product to your client.

6. How can I protect my company?

Of course, you want to prevent feed fraud adversely affecting the quality and safety of your products and / or damaging your company. A 100% prevention of feed fraud will often not be possible. Key in feed fraud control is having insight into the vulnerability for fraud and a fraud control plan tuned thereto, focusing on deviations from the ordinary.

What control measures can I implement?

A fraud control plan can consist of various elements:

- Designing an **(business)organization** that is prepared for handling fraud signals, has an open culture to report and discuss them and that is responsible for implementing the fraud control measures: who does what, who decides, who is informed. Does the fraud control plan work as it should and do I protect my company as intended? (verification, validation, audit, management goals)?
- Determine what the **common practice is / what the standards are.** When you know what the common practice is / what the standards are, you can determine what is **deviating**. **The deviation** may be a **signal** that fraud has been committed. In practice a combination of information - combined - will trigger a signal for possible fraud. The combination of signals is not always the same and/or predictable. Common sense, interpretation, experience and knowledge are needed to determine this. It should be kept in mind when adulteration is common practice this should not accepted. Below (table 3) some situations are described that indicate that fraud might be committed.
- Implement **fraud control measures** that help control fraud or detect fraud at an early stage. Several examples of possible *fraud control measures* are given.

Table 2: Examples of possible fraud signals

Example 1
A cereal is offered to a Dutch company at a surprisingly low price. The past season the quality of this cereal has been variable and it is known that several lots have exceeded legal standards for a specific contaminant. The cereal is of Rumanian origin and is stored in Denmark.
Possible fraud signals: • Surprisingly **low price.** • **Deviating lots** are present on the market that exceed / exceeded legal contaminant levels. • **Strange logistic route** of the feed material: origin Rumania, stored in Denmark.
Example 2
A high protein feed material of a specific origin with low levels of contaminants is offered to a client at a normal price. Origin is of importance because it is known that specific countries of origin have high levels of contaminants and other countries of origin have low levels of contaminants. The feed material is produced in a country with a high level of poverty. The feed material has a long inland logistic route and is collected at an international harbor. The feed material is transported in bags that are opened for bulk transport in seagoing vessels.
Possible fraud signals: • In this case the feed material has **added value** because of high protein and because of **specific origin** with low levels of contaminants.

• The feed material is produced in a country with a high level of **poverty.** • After production the feed material is bagged, but during the loading process of the goods in sea going vessels these bags are opened, this will gain **access** to the product.
Example 3
A locally stored batch of liquid feed material is offered at a normal price. The batch is stored in a pool with batches of the same feed material from different owners and/or origin. The storage site does not check whether the incoming batches originate from a GMP+ assured flow or from a flow assured via a gatekeeper protocol
Possible fraud signals: • The product is a **liquid** which is easier to adulterate than a solid product. • **Lack of control** incoming batches.

7. Is my company prepared?

A 100% prevention of feed fraud is not realistic. This means that, in addition to the fraud control plan, you must also prepare your company for what to do in case of a fraud signal.

A fraud signal...does a company know what to do?

Within the *GMP+ FC scheme* there are already several documents covering incident management in the areas of:

- *Early Warning System*
- Guidelines Recall and Identification and Traceability
- Non-conforming products (TS1.5 *Specific feed safety limits)*

If the companies management expects that a fraud incident may have substantial impact it is advised to set up a crisis team to coordinate the approach to the incident.

If the fraud incident compromises (the assurance of) the feed safety, the EWS procedure of GMP+ International applies. In this case, you need to report the matter to GMP+ International and to the authorities if the legislation in your country requires so. In case of doubt, you can contact GMP+ International to consult on whether or not the EWS procedure applies. Thanks to reports about (potential) issues that affect the feed safety, the EWS procedure helps prevent or limit damage by means of adequate measures. GMP+ International will handle reports of (suspicion of) fraud confidentially.

Appendix 1: Team of specialists

The management of the company is responsible for forming team of specialists that will gather the basic information needed to determine a companies' fraud vulnerability. The companies´ management shall ensure that members of this team of specialists will have adequate time and (if necessary) resources available.

Besides assessing a companies' feed fraud vulnerability, the team of specialists can also supervise the set up and implementation of feed fraud control plan.

In addition to implementation, the team can be designated to a role in maintenance and verification of the fraud vulnerability assessment and the feed fraud control plan.

The size of the team of specialists depends on the organization's size and on the expertise of the team members. Knowledge of various topics is required: e.g. technical expertise as well as expertise in the field of chemistry of feed, toxicology, microbiological knowledge of feed, quality management, supply chain knowledge, purchasing, products, suppliers, producers, transporting and warehouse companies, security, criminology.

In addition to the various fields of expertise, team members should come from the various hierarchical levels of the company. This should ensure support throughout the company.

Helpful tip:

Depending on the size of a company the different fields of expertise can come from one person. If necessary a company may deploy the services of qualified external experts.

The following fields of expertise may be represented in the team of specialist:

a. Company management: The companies' management is responsible for developing business goals, and designing strategies related to feed fraud and organizing business resources to achieve those goals. The management demonstrates its involvement in the development and implementation of the feed fraud management system and can be a decision-maker within the team.

b. Production of finished products: ingredients are used to produce feed into finished products. Ingredients have an effect on the finished products (e.g. technological, quality, physical, nutritional). During the processing of ingredients, deviations may get noticed. Knowledge of processing techniques and the finished products can be useful for the vulnerability assessment of feed ingredients.

c. Production of ingredients: Ingredients are processed with the help of specific production processes. Knowledge of the production processes of ingredients is needed to assess possible opportunities for feed fraud.

d. Quality: The quality of ingredients and finished products can be affected by feed fraud. In addition, knowledge of quality systems is useful to assess the general level of quality control of the various participants in the supply chain. Knowledge of required documentation, import controls and insight into the quality of feed

ingredients and finished product and knowledge of microbiological, chemical and physical characteristics is required.

e. Purchasing: Ingredients are purchased on a daily basis. Contact with suppliers provides information about feed ingredients, but also about market situations, other participants in the supply chain, crop yield, the situation (e.g. poverty, corruption, natural disasters) in the country of origin. This information can be used to determine where opportunities and motivations for committing feed fraud are present.

f. Storage: After production, the ingredients can be stored by e.g. a storage company. The situation at this storage company may provide opportunities to commit feed fraud, or the situation in the country of storage may provide motivations to commit feed fraud.

g. Transporting: Ingredients are transported from the producer to the client. This can be straight from the producer to the client or via intermediate storage. The means of transport may change during the route to the client and an ingredient may cross various countries or sites. During transporting opportunities and motivations to commit fraud can be present.

h. Business finance: The financial situation of a company may provide motivations to commit feed fraud. Insight in the financial situation of the supply chain participants is needed to assess the motivations per participant in order to determine the feed fraud vulnerability.

i. Human resourcing: Having certain personal characteristics or persons in certain situations provides motivations to commit feed fraud.

j. Laboratory analytics: Chemical, microbial and physical characteristics of feed ingredients can be analyzed by a laboratory, but may also be analyzed on site e.g. using quick screening tests. It is important that correct methods of analysis are used in order to interpret analytical data correctly. Analytical data can give signals that there is a possibility that fraud has been committed.

k. Feed chain: A feed ingredients “moves” within the supply chain, meeting various opportunities and motivations for feed fraud. How this supply chain looks likes affects the vulnerability for feed fraud.

The members of the team of specialist can be Feed Safety team members but also other fields of expertise and experience should be present to ensure that feed fraud is covered.

Specialist in the team should attend a training in which feed fraud is addressed or the team members should have attained a similar level based on experience.

It is advised that the company records the team members as well as the fields of expertise.

Appendix 2: References

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We enable every company in the feed chain to take responsibility for safe and sustainable feed.

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