



STRATEGIC BUSINESS PLAN

ISO/TC 293 Feed machinery

EXECUTIVE SUMMARY

Meat, egg, dairy and aquatic products, which are provided by the breeding industry, are common food for humans. In modern society, along with human's growing demand for animal derived food, feeding with formulated feed has replaced that with simple grain as the former one is more scientific and effective, and the large-scaled breeding industry has appeared. The development of the large-scaled breeding has inspired the birth of the feed industry on industrialized processing formulated feed. Feed industry has become an indispensable livelihood industry in every country. Nowadays, the manufacture of the industrialized feed is accomplished by automatic production lines for feed processing which consist of various feed machines in accordance with certain technical requirements. The feed machinery manufacturing provides equipment for feed industry all over the world and it is a globalized industry of importance.

The field of the ISO/TC 293 refers to the feed machinery used in the feed processing mills which produce formulated feed in an industrialized way. Feed industry enterprises are the users of feed machinery manufacturing. There are over 30,000 feed processing mills around the world. Besides using the domestically produced feed machinery, they also need to purchase worldwide, in consideration of various aspects including performance, cost, service and supply of goods, to maintain, reconstruct, expand and build their feed production lines. More than 100 countries and regions are involved in the import and export business of feed machinery every year. The international trade of feed machinery has already been globalized.

When the globalization of international trade of any industry reaches a certain level, it is inevitable that international standards are required to coordinate related technological matters. International standard of feed machinery is an urgent demand for its international trade. Standards of the ISO/TC 293 will harmonize the national, feed machinery manufacturers' and users' standards or criteria and seek for the best solution, which will facilitate the international technological exchange and international trade of feed machinery, improve efficiency, decrease the cost of projects, ensure occupational hygiene and personal and property safety for operating workers, and make sure that the feed formula meets the feed formula quality and hygiene requirements.



Through the development of international standards concerning harmonized terminology of feed machinery and feed processing technology, graphic symbol, safety and hygiene requirements, technical requirements on single machines and complete sets of equipment for production lines and test methods of important performance of feed machinery, the main objectives of the ISO/TC 293 are to minimize the security risks in the process of feed production, as well as the risks of feed hygiene, workplace sanitation and environmental pollution, to propose the best solution to the security and hygiene of the feed machinery, to supply the technical basis to conformity assessment and the impartial technological basis to orders and project inspection and acceptance of the complex feed processing complete sets of production lines and to make no barrier to international communication.



1. INTRODUCTION

1.1 ISO technical committees and business planning

The extension of formal business planning to ISO Technical Committees (ISO/TCs) is an important measure which forms part of a major review of business. The aim is to align the ISO work programme with expressed business environment needs and trends and to allow ISO/TCs to prioritize among different projects, to identify the benefits expected from the availability of International Standards, and to ensure adequate resources for projects throughout their development.

1.2 International standardization and the role of ISO

The foremost aim of international standardization is to facilitate the exchange of goods and services through the elimination of technical barriers to trade.

Three bodies are responsible for the planning, development and adoption of International Standards: [ISO](#) (International Organization for Standardization) is responsible for all sectors excluding Electrotechnical, which is the responsibility of [IEC](#) (International Electrotechnical Committee), and most of the Telecommunications Technologies, which are largely the responsibility of [ITU](#) (International Telecommunication Union).

ISO is a legal association, the members of which are the National Standards Bodies (NSBs) of some 140 countries (organizations representing social and economic interests at the international level), supported by a Central Secretariat based in Geneva, Switzerland.

The principal deliverable of ISO is the [International Standard](#).

An International Standard embodies the essential principles of global openness and transparency, consensus and technical coherence. These are safeguarded through its development in an ISO Technical Committee (ISO/TC), representative of all interested parties, supported by a public comment phase (the ISO Technical Enquiry). ISO and its [Technical Committees](#) are also able to offer the ISO Technical Specification (ISO/TS), the ISO Public Available Specification (ISO/PAS) and the ISO Technical Report (ISO/TR) as solutions to market needs. These ISO products represent lower levels of consensus and have therefore not the same status as an International Standard.

ISO offers also the International Workshop Agreement (IWA) as a deliverable which aims to bridge the gap between the activities of consortia and the formal process of standardization represented by ISO and its national members. An important distinction is that the IWA is developed by ISO workshops and fora, comprising only participants with direct interest, and so it is not accorded the status of an International Standard.



2. BUSINESS ENVIRONMENT OF THE ISO/TC

2.1 Description of the Business Environment

The feed machinery in the working filed of the ISO/TC 293 refers to all the equipment used to process formulated feed in an industrialized feed processing mill where the feed materials are received, cleaned and after a series of processing become the finished packed products ready to be delivered. The machinery includes principal machines, auxiliary machines and electrical control systems dealing with feed materials receiving, cleaning, feed grinding, grading, quantitative batching, mixing, conditioning, extruding, pelleting, flattening, liquid adding, drying, cooling, post coating, conveying, storage, dust removing and quantitative packaging. Applying the theory of modern nutriology and based on various nutritional requirements of different kinds, physiologic stages, objectives of production and feeding models of livestock, poultry, pets, and aquatic animals to ensure complete and balanced nutrition, the formulated feed is of good composition uniformity and with certain shape which can be directly gathered and eaten by animals, and it is commercial feed which is confected and produced from dozens of proportional feed materials and additives, selected from hundreds of optional feed materials, by industrial production process. The formulated feed is also complete feed, which includes all the necessary nutrients for animal growth and development so that the animals only need to drink additional water to meet the nutritional needs. Because of the complexity of processed objects, great varieties and different physicochemical characteristics in feed materials, and finished feed products, it is decisive that the production process of the formulated feed is long and there are many categories and varieties of feed machines. Industrialized feed processing is accomplished by automatic production lines which consist of the above-mentioned feed machines basing on specific technical requirements under the centralized control of computers. The fact that feed materials for special purpose are processed into the formulated feed through special processing procedure determines that the feed machinery has become a group of self-contained machinery of specialized field. In the system of feed machinery, even if the names of some equipment seem to share common keywords with those of other industries, this kind of equipment used for feed production lines needs to be designed specifically. Like the fact that many industries share the common keywords of names of some equipment, but these kinds of equipment have different uses, structure patterns and performance requirements in different industries and conform to different standards.

Humans need to consume animal derived food and all countries have breeding and feed industry. Therefore, the feed machinery manufacturing is distributed worldwide. Although in each country the scale of feed machinery manufacturing varies, from a global perspective the size of this industry is quite large already. Every year the international trade of feed machinery involves more than 100 countries around the world, thus it proves the size of feed machinery manufacturing and the universality of its international trade.



Furthermore, this industry will keep developing rather than declining since the feed machinery manufacturing is closely related to people's livelihood.

The stakeholders of the ISO/TC 293 working field are mainly feed machinery manufacturing, feed industry and government regulators.

A lot of important problems that perplex the major stakeholders and require coordination and solution by international standards have appeared during the international trade and technological exchange of feed machinery.

Feed machinery and its specific component parts are numerous and diverse, and there are a large number of concepts concerning feed processing technology. Due to the disagreement among the countries on the terminology as well as the application of graphic symbols of feed machinery and feed processing technology, the barriers to the international trade and technological exchange of feed machinery have emerged.

Those feed processing enterprises pay much attention especially to the safety of feed machinery. Only a few countries have national standards dealing with the feed machinery, while basing on its own benchmark each feed machinery manufacturer produces feed machines according to their own knowledge and technical ability in consideration of the cost. Large-scale multinational feed producers have their own purchasing standards. It is highlighted that these standards or norms about the safety requirements of feed machinery are not coordinated or consistent, which have been greatly hindering the international trade of feed machinery. Take Chinese feed machines to be exported for example: when exported to Europe, South Africa and Tanzania, the products that implement the Chinese standards are required to obtain the certifications of CE, SABS and TBS respectively; when exported to the CIS, the products are required to implement the GOST standards; For the Chinese products which already have CE-markings, British users would hire a domestic safety assessment company to reevaluate the security and request a lot of restructuring; Algeria and South Korea require the electronic control system to be modified in accordance with product model of European companies; an Iranian user believes that the energy consumption of belt granule feed dryer is too high without any domestic standards or test methods; an American company demands that the explosion-proof and other safety requirements of elevators meet their specifications, and so on. Not only will the loss of time and money occur when the exported feed machinery is required to adjust by users upon arrival in importing countries, but also the coordination will be difficult to continue as long as the understanding of both sides on technical requirements cannot be agreed. Feed machinery operates under the environment of combustible dust, so there is a potential risk of explosion. Harmonized and generally recognized standards dealing with division of dangerous zones in a feed workshop, electrics and dust explosion prevention of mechanical equipment are required.



Besides depending on the hygiene of feed material itself, feed hygiene is also under the influence of technological design and equipment performance during the feed processing. An analysis on hygiene risks of feed processing has found: if the material of feed machinery parts which have contact with feed is not selected properly, the feed will be contaminated by poisonous and harmful substance; defective structure design of the feed machinery can lead to feed residues, which will cause cross-contamination with various feed and which, if deteriorated, will also cause the contamination to the feed from microbial bacteria; insufficient precision of batching, adding and coating systems and mixing machines will make micro additives excessive and toxic; the performance of feed dryers has an effect on the moisture uniformity and the moisture can be partially excessive so that the safe storage of feed can be influenced; the inappropriate technological design on the production lines with sets of equipment for feed processing will worsen the cross-contamination and cause toxic feed due to the segregation of micro components; noise and dust emission caused by feed machinery will affect people's health and surrounding environment. The above-mentioned threats posed by feed machinery to the feed hygiene, environment and operators' health need to be coordinated and addressed by international standards.

In the international trade of feed machinery, it is common to place an order for feed production lines consisting of dozens or hundreds of equipment according to certain processing technology. This kind of contracts values high and involves complicated technology, so it is common that controversy appears during contract signing and project acceptance. It is difficult to coordinate but easy to have economic loss. Both suppliers and users are hoping for the international standards to provide the fundamental technical support in order to resolve difficulties in signing contracts and mediate the dispute during the construction and acceptance of projects. Consequently, efficiency can be enhanced, the cost of projects can be saved, and the quality of projects can be guaranteed. The international standards in this aspect can also provide the design of complete production lines for feed processing with fundamental technical basis to solve the problem from the origin.

The small-sized users in developing countries usually do not have their own purchasing standards. They only present their unspecific technical requirements to the ordered equipment in the contract, so they hope to get support from relevant international standards to reduce the risk. In some countries, the customs and users require testing or certification for the imported feed machinery, especially when related to the product performance and the specific technical requirements. Since there is neither domestic standard nor international standard of feed machinery, the coordination will be in a dilemma.

Gathering many excellent experts around the world, the ISO/TC 293 summarizes and keeps track of the latest scientific and technological achievements of feed machinery to develop international standards in view



of the market demand, which will not only provide the international trade with technical support but also promote the technical progress from manufacturer's side so as to ensure that the users can purchase the products of good performance.

Although the feed processing technology and various feed machinery of nations from purpose, working principle to main structure are basically the same, there are big gaps in the product performance and technical levels of feed production line processing design of each manufacturer. Along with the continuous rise in costs of labor, feed materials and energy, feed processing enterprises have entered an era of meager profit, which is very obvious in China. These factors determine that the main development patterns of feed processing enterprises will be large scale, high efficiency and lower cost. Feed processing enterprises pay much attention especially to the safety of machinery, the performance of single machines, the advancement of technological design in feed processing and automatic control technology of production lines. In order to decrease the cost of procurement and construction, orders for complete sets of equipment keep increasing. With the increasing awareness of food safety, healthy breeding and feed safety and with the necessity to improve the quality of feed products and enhance market competitiveness, the feed processing equipment and production technology which can accomplish no cross-contamination, low or non-residue, high precision of batching and good mixing uniformity are required. Feed processing needs to consume energy intensively and the equipment of high efficiency is much preferred. Thus, the development direction of feed machinery will be precision, high efficiency, large scale, integration and automation and the further development will be intelligence and service network. The above-mentioned demands for the development of feed industry and the technology progress of feed machinery manufacturing will be what the ISO/TC 293 pays close attention to and put into standard research.

Quality of feed, supervised by government, affects the healthy breeding and the security of human food. Feed machinery is the guarantee to achieve the specified quality of feed formula and the hygiene of feed. In addition to administration, the safety in production in feed mills significantly depends on the safety of feed machinery. In China the establishment of feed mills must be approved by the government and one of the conditions is that the feed machinery those mills use must conform to the relevant standards. Therefore the work of the ISO/TC 293 is also necessary for the government supervision departments.

2.2 Quantitative Indicators of the Business Environment

Feed processing enterprises are the users of feed machinery manufacturing, so the development of feed processing enterprises is directly related to the feed machinery manufacturing. According to a survey on 130 countries released by the ALLTECH, the amount of feed mills and feed output from 2012 to 2014 can be

observed in the following table 1. The amount of feed mills increased by 1960 in 2013 compared with 2012, while in 2014 the figure increased by 2843. In 2014, China, with a total of more than 9500 feed mills and 189 million tons of feed, led the world once again in both of the amount of feed mills and feed output. The US and Brazil ranked the second and the third respectively. There were 5236 feed mills in the US with an annual feed output of 169 million tons, while Brazil had 1237 feed mills with a feed output of 67 million tons. Asia is the area with the largest feed output around the world, while Africa is experiencing the fastest growth in feed output and the Middle East is the largest one in feed mills. The quantity of feed mills in China has tended to decrease because of the policy that the government encourages to expand the scale of feed mills and reduce the amount of those to improve the production efficiency and product quality. The decrease in small feed mills and increase in large-scale ones will enhance the demand for feed machinery and large-scale equipment.

Table 1. Global amount of feed mills and feed output in 130 countries

Year	Amount of feed mills	Feed output (million tons)
2012	26240	954
2013	28200	963
2014	31043	980

The regional distribution of amounts of feed mills and feed output is as the following table 2.

Table 2. Regional distribution of amount of feed mills and feed output

Region	Amount of feed mills	Feed output (million tons)
Africa	1150	34.57
Asia	13736	350.54
Europe	5165	232.58
Latin America	3914	144.84
Middle East	288	24.75
North America	6790	192.80
Total	31043	980.07

Note: The above data is from the website of ALLTECH.

It is difficult and almost impossible to find out the global value of trade of feed machinery, but even in the light of the quantity of countries to import and export certain sorts of feed machinery from 2011 to 2013 (see table 3.), the universality of international trade in feed machinery can be concluded.

Table 3. Quantity of countries importing and exporting certain sorts of feed machinery from 2011 to 2013

Items	Quantity of countries importing feed machinery			Quantity of countries exporting feed machinery		
	2011	2012	2013	2011	2012	2013
Quantity of trading countries in feed machinery	147	130	166	83	79	83
Quantity of countries with more than \$1 million (US) value ^a of trade	74	77	88	37	42	39
Quantity of countries with moth than \$10 million (US) value of trade	24	31	29	16	19	19
^a . Value of trade in certain sorts of feed machinery						

Although it is impossible to calculate the global annual trade volume of feed machinery, it is possible to estimate the number of spare parts that the feed mills need to purchase every year. No matter domestic supply or international procurement, the value of trade of mere spare parts is approximately \$ 20-25 (US) billion.

3.BENEFITS EXPECTED FROM THE WORK OF THE ISO/TC

The following aspects of standardization will be the main objectives of the ISO/TC 293. As these objectives will be achieved step by step, the stakeholders will expected to benefit from them respectively.

Harmonizing terminology and definition of feed machinery and feed processing technology as well as graphic symbols of feed machinery worldwide will provide technical exchange on feed machinery with convenience.

Studying the safety of feed machinery, which includes: the division of dangerous zones at a feed processing workshop under the environment of combustible dust and the technical requirements to dust explosion



prevention of electrical and mechanical equipment in different areas; on the basis of the security risk assessment to every kind of feed machinery, coordinating the technical specifications of security between suppliers and users as well as national security certification standards and technical regulations, a series of standards dealing with the security of feed machinery will be developed to remove the main obstacles to the international trade of feed machinery and to provide operating workers with a safe working environment and meanwhile to ensure the safety in production of feed mills.

Studying the hygiene of feed machinery is to assess the hygiene risk of technological design in single machines and feed production lines and to develop standards required by the hygiene of feed machinery so as to ensure the hygiene of feed, a healthy and cozy working environment for operating workers and dust emission during feed production conforming to requirements of environmental protection.

Studying the test methods to technical requirements and important performance of single machines and complete sets of equipment for feed processing which can impact on feed quality, production efficiency and energy consumption. Developing relevant standards is to provide the quality evaluation of feed machinery with the technical basis and to provide the international trade of complete sets of equipment for feed processing and the construction and acceptance of feed engineering with fundamental technical support, in order to eliminate the obstacles to the international trade, raise the efficiency, prevent loss, save costs and guarantee the rational interests of both manufacturers and users. The deliverables of the ISO/TC 293 in this respect can also promote product research and technological advance of the feed machinery manufacturers.

Along with the developing demand of the feed industry, the further work of ISO/TC 293 will focus on the intelligence of feed processing lines and the service network.

Standard of the ISO/TC 293 is the largest consensus, adapting to the global trade, and at the same time voluntary. When the feed machinery manufacturers of nations set their own criteria basing on the standards of the ISO/TC 293, not only will the company's products adapt to the global trade, but also their differentiation advantages will be further developed.

The standards of the ISO/TC 293 dealing with the safety, the hygiene and environmental requirements of feed machinery are necessities for regulators. On this basis, the government can also establish regulations that meet the needs of the society.

The more abundant the ISO/TC 293 standards become, the more benefits the feed machinery manufacturers, the feed industry and national economy will obtain.



4. REPRESENTATION AND PARTICIPATION IN THE ISO/TC

4.1 Countries/ISO member bodies that are P and O members of the ISO committee

4.2 Analysis of the participation

The feed machinery manufacturing has a long history of development in Europe and America. Because of the large population and the developed feed industry in Asia, the quantity of Asian feed mills accounts for 44% of the total number of feed mills around the world, which has promoted the development of the feed machinery manufacturing. Therefore, most of the members of the ISO/TC 293 are from Europe and Asia, while the US has also become a P-member recently.

The ISO/TC 293 encourages the involvement of the stakeholders and experts from different countries and industries to participate in the work of this TC. The ISO/TC 293 is confident that with the work of this TC continues, there will be more and more participants.

5. OBJECTIVES OF THE ISO/TC AND STRATEGIES FOR THEIR ACHIEVEMENT

5.1 Defined objectives of the ISO/TC

In order to open the global market, create a good business atmosphere and promote the development of international trade of feed machinery, the basic objectives of the ISO/TC293 are:

1. spreading of participation to more manufacturers and users of feed machinery with more excellent experts with whom the technological innovation achievements will be shared and a broad consensus will be reached in the process of developing standards of feed machinery;
2. specific terminology of feed machinery and feed processing technology as well as graphic symbols of feed machinery which will be offered to manufacturers and users;
3. research and proposal of technical requirements to the division of dangerous areas at a feed processing workshop under the environment of combustible dust and of dust explosion prevention of electrical and mechanical equipment in different areas, and harmonization of safety standards on feed machinery at international level;
4. the focus on the factors that the feed machinery and feed processing design affect the feed hygiene, the operating workers' health and the environment during the processing in order to provide the manufacturers with the best solution to the hygiene of feed machinery;
5. to meet the users' needs to selecting feed machinery, signing contracts, feed engineering construction and the acceptance of the need, and to study the test methods to technical requirements and important



performance of single machines and complete sets of equipment for feed processing which can impact on feed quality, production efficiency and energy consumption and to develop relevant standards;

6. considering the users' needs for improving the automatic level of feed processing production line, the intellectualization of feed processing and the service network.

The sequence of the above-mentioned objectives will also be the sequence of developing international standards. Standardization of safety, hygiene and complete sets of production lines for feed processing intends to be the priority areas of the technical committee.

5.2 Identified strategies to achieve the ISO/TC's defined objectives

Contacting and attracting stakeholders and experts across diverse disciplines from more countries to participate in the work of the ISO/TC 293 in order that the rationality and feasibility of the ISO/TC 293 standards can reach a broader consensus and become more popular with the international community.

First, the research on the standard system of the feed machinery standard system will be started, including the hierarchy (in the shape of tree upside down) and standard system tables. In order to make all the standards in the professional field of feed machinery with coordination, unity and compatibility, to avoid any conflict and confusion, and also to save the resources to develop standards, it is necessary to establish the reasonable and coordinated standard system according to the inner links (up and down or left and right) of all standardized objects in this professional field. This is the foundation and basis to achieve the goal of standardization.

Those basic standards at the top of the standard system, such as terminology, graphic symbols, safety, hygiene subjects and so on can be the first to develop standards. The projects on the upper layer have the priority to develop standards than the lower layer. For the testing methods of generic technological requirements needed by two or more product standards, the standards can be developed separately for the testing methods and prior to the product standards.

When the projects concerning safety and hygiene are proposed, attention should be raised to the collection and analysis of the terms of the relevant technical regulations at the regional and national levels in order to make sure the feasibility of the contents in the international standards ready to develop. Collection of the standards at national level and the manufacturers' technical specifications will be considered as the source files for developing relevant standards. Especially when draft safety standards are developed, the methods specified by the type-A safety standards of ISO/TC 199 should be adopted. The draft safety standards of ISO/TC 293 should also be in accordance with the relevant type-B standards of ISO/TC 199.



Establish the liaisons with the ISO/TC 199 Safety of machinery and ISO/TC 34/SC 10 Animal feeding stuffs. Basic standards dealing with mechanical safety is instructive and meaningful to developing safety standards of product; tracking requirements of feed quality in order to determine the relevant technical requirements of the feed machinery.

It is a plan to set up working groups, such as research on the feed machinery standard system, safety of feed machinery and hygiene. Working groups are likely to be needed.

Learn and insist on the regulations set by the ISO to carry out the work of this technical committee.

Try as much as possible to use modern means of communication to carry out the work of this technical committee in order to improve the efficiency of work and save costs.

This TC plans to hold a plenary meeting each year to discuss anything important related to the resolutions. Each meeting will be hosted by a member.

6. FACTORS AFFECTING COMPLETION AND IMPLEMENTATION OF THE ISO/TC WORK PROGRAMME

The implementation of the work plans of any ISO technical committee depends on the P-members' participation of the TC, energy the experts can input and the funds required for the early stage of the project research, development and verification. The technical committee is newly established, so it is difficult to estimate for the moment what the factors are that will affect the implementation of the work plans. China and the secretariat will make efforts first, and it is certain that P - member countries will be actively involved in the action.

7. STRUCTURE, CURRENT PROJECTS AND PUBLICATIONS OF THE ISO/TC

This section gives an overview of the ISO/TC's structure, scope, projects and publications. All of this information is updated regularly and is available on ISO's website, ISO Online.

The link below is to the TC's page on ISO's website:

http://www.iso.org/iso/home/standards_development/list_of_iso_technical_committees/iso_technical_committee.htm?commid=5364893

Click on the tabs and links on this page to find the following information:

- About (Secretariat, Secretary, Chair, Date of creation, Scope, etc.)
- Contact details



- Structure (Subcommittees and working groups)
- Liaisons
- Meetings
- Tools
- Work programme (published standards and standards under development)

Reference information

[*Glossary of terms and abbreviations used in ISO/TC Business Plans*](#)

[*General information on the principles of ISO's technical work*](#)