# The Sampling Quality Control in the Routine Monitoring of Livestock and Poultry Products

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**Abstract** The routine monitoring of livestock and poultry products is the monitoring work carried out by the Ministry of Agriculture in order to grasp the quality and safety of national livestock and poultry products, and the sampling work is the first part of routine monitoring. This paper analyzes various factors during the implementation of sampling work such as preparatory work, sampling tools, sampling process, pretreatment, packaging, transfer, storage conditions and sample delivery. Carrying out the effective quality control can help to ensure the impartiality of the test results so as to provide reliable scientific basis for the department to study regulatory measures.

**Key words** Livestock and poultry products, Routine monitoring, Sampling work, Quality control

## 1 Introduction

On the fifth plenary session of the Food Safety Commission, Premier Li Keqiang pointed out the food should be placed in the most important position, and required a comprehensive investigation of food safety risk hazards, to let people eat safely at ease. The livestock and poultry product is one of the most important human foods, and its food safety issue has always been the focus of public attention. The security problems concerning livestock and poultry products are likely to occur in the links of raising, slaughtering, transportation and marketing. The livestock and poultry routine monitoring and inspection work of the Ministry of Agriculture aims to troubleshoot the security risks in the livestock and poultry products, and test, analyze and assess the harmful factors affecting the quality and safety of livestock and poultry products systematically and continuously. The test results provide a basis for various departments to find cause of the problem and research regulatory measures. Sampling is an important base to to ensure fair, scientific and accurate test results, so it is very important and necessary to implement strict quality control over the on-site inspection and sampling. The sampling quality control elements in the livestock and poultry routine monitoring include preparatory work, sampling tools, sampling process, pretreatment, packaging, transfer, storage conditions, and sample delivery.

## 2 Sampling principles and sample requirements

Sampling work should be strictly carried out in accordance with the procedures and methods to ensure the random sampling. It is necessary to take the necessary security measures to ensure the fairness and authenticity of sampling. The samples taken must not be washed, and the samples are divided into three parts. One is for testing, one is for sample retention of testing units and the third one is for sample retention of the units to be sampled. The number of each part of sample should meet the needs of a complete analysis every time. The clean food bags are used to package the samples and the seals are affixed to mark the sample sealing date, sample number and sample names. At the same time, the sampling person and the person to be sampled should sign and stamp on the seal.

## 3 The quality control of preparatory work

In the work of national livestock and poultry product quality and safety routine monitoring, the Ministry of Agriculture is responsible for the enactment and promulgation of routine monitoring plan, supervision and management of the routine monitoring process, and briefing of monitoring results. The local administrative departments are responsible for assisting the implementation of routine monitoring. The testing agencies are responsible for the sampling, pretreatment, testing and result reporting of livestock and poultry products. The staff of various departments should perform their own functions and carry out the routine monitoring strictly in accordance with Agricultural Product Quality and Safety Monitoring and Management Regulations and other rules and regulations to ensure the accuracy and fairness in the whole process.

**3.1 Sampling discipline** (i) In order to form effective mutual supervision, there should be at least two people involved in sampling work, and one of them, responsible for the specific implementation of sampling procedures, had better have extensive sampling experience and the ability to cope with unexpected events. The honesty and fairness are also required. (ii) The sampling should be conducted according to a predetermined plan. It should not be changed without permission and it is not subject to administrative intervention. The sampling plan is made based on product standards and sampling methods. It is the instruction for sampling work, and can regulate sampling and test work. (iii) Once the sampling work is completed, any unit or individual has no right to conduct re-sampling without the approval of administrative department of agriculture. (iv) The personnel involved in routine monitoring should maintain secrecy on the work program and test re-

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sults, and must not disclose the information to any unit or individual outside the task assignment department. In order to ensure the accuracy of the test results, it is necessary to implement surprise sampling. Sampling personnel must not conduct tendentious sampling and they should rationally draw samples to always ensure the representativeness of sample.

**3.2 Learning sampling techniques** (i) The sampling personnel should be familiar with the national sampling laws and regulations, standards and related documents, as well as the test content of sample. They should also have a serious and responsible attitude to work and hold a job card. (ii) The sampling personnel should receive training and the content includes the knowledge and standards related to the sample product, sampling methods and sampling amount of the samples that have been determined, precautions during sample sealing, and precautions during the sample storage and transport.

## 4 The quality control of sampling tools

Before carrying out the sampling, it is necessary to determine the implementation program for sampling according to relevant standards and documents, and prepare appropriate sampling materials and tools. It includes task documents, work permits, sampling list, relevant survey forms, sample bags, seals, sampling tools, pretreatment tools, sealing glue, labels, disposable gloves, mixers, etc. Sampling tools include stainless steel knives, clean plastic bags with sealing strips, urine sample bottles, sample storage boxes, etc. The materials prepared are classified and the tools should be clean and dry, not reacting with the sample.

## 5 The quality control of sampling process

**5.1Showing documents and work certificates** The sampling staff should take the initiative to show the task documents related to routine monitoring, work certificates and identity card, and submit sampling list to the examined units.

**5.2 On-site sampling and recording** The sampling staff should perform the sampling in the sampling site strictly according to sampling procedures. The number of samples is determined based on the task documents, and the sampling method is in accordance with NY/T 5344.6 – 2006 *Part 6 of Pollution-free Food and Product Sampling Regulations* and NY/T 763 – 2004 *Pork*, *Pig liver*, *Pig urine Sampling Method.* There is a need to carefully fill out the sampling form during sampling, ask the person to be sampled about some information and make the person to be sampled sign the form. The sampling form is made by the Ministry of Agriculture, and the form is filled out in triplicate for the Ministry of Agriculture, inspection agencies and the sampled units, respectively.

## 6 The quality control of filling out sampling form

Sampling form is one of the important instruments in the routine monitoring of livestock and poultry products, which records the important information on the product inspection and judgment by the quality inspection agency, so it is necessary to carefully and clearly fill out the sampling form. Special attention should be given to the information about the sample sources including the specific address of sample, supplier's name and contact way in order for traceability. In the sampling process, it is necessary to pay attention to the information concerning production, operation and management of the sampled units as well as production, transfer, consumption and quality of local livestock and poultry products, in order to provide a reference for the higher authorities. Meanwhile, it is necessary to collect image data and photograph the relevant material evidence in the sampling points if necessary.

## 7 The quality control of pretreatment

After the livestock and poultry sampling is completed, it is necessary to perform the pretreatment of samples according to the laboratory sample pre-processing methods. For example, pork, beef, lamb, pig liver and poultry meat are evenly divided into three parts and then the samples are placed in a clean sealed bag; eggs are shelled and placed in a cup covered with a disposable plastic bag, and evenly mixed into three samples to be placed in small plastic bottles and sealed.

## 8 The quality control of sample packaging, transfer and storage conditions

Samples collected should not be drenched, contaminated or lost. (i) The samples for the detection is stored in −18 ℃ refrigerator after checking the package. (ii) The samples for re-detection should be frozen. (iii) The samples for detection and re-detection should be properly kept. (iv) The egg liquid and urine samples should be properly sealed to prevent leakage. (v) The means of transport should be kept clean and there is a need to prevent sample contamination in the storage location or at loading or discharge points. (vi) During transport, it is necessary to note the sample storage conditions, the temperature should not exceed 4 ℃, and the time does not exceed 24h to prevent deterioration of the sample.

## 9 The quality control of sample delivery

When the sampling staff bring the samples back to the laboratory and deliver them to the sample keepers, it is necessary to see whether the sample bags, labels and seals are intact, whether the samples are deteriorated, and whether the sampling information is consistent with the samples. After confirming the samples and information, both sides sign the sample receipt form. The sample keepers label samples and deliver them according to laboratory quality management system processes.

## 10 Conclusions

Sampling is the basis of accurate and reliable routine test results of livestock and poultry product quality and safety. The effective quality control of some factors (such as preparatory work, sam-

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cance to increasing farmers' income. *Juglans sigillata* cultivation generally takes more than eight years to enter full bearing period, so it is a long-term industry making tremendous contribution to increasing farmers' income in the long term. *Pisum Sativum* L. and safflower are affected by winter and spring rainfall, but there is less investment and high yield, thereby making great contribution to increasing farmers' net income. Thus, *Juglans sigillata*, *Pisum Sativum* L. and safflower will become the major industries for further improving farmers' net income in the future.

**4.2 Recommendations** (i) It is necessary to continue to consolidate and enhance hybrid corn cultivation and hog breeding. Special attention should be given to increase of hybrid corn yield and total amount of hogs for sale. (ii) It is necessary to expand the growing area of *Juglans sigillata* in the regions at an altitude of 1800 – 2500m while strengthening the promotion of the use of production increase and productivity improvement technology for young plantations. (iii) It is necessary to adjust the spring crop planting structure according to local conditions. The regions at an elevation of less than 1600m should develop early winter *Pisum Sativum* L. with Zhongwan 6 as the main variety, or use the efficient cultivation of three crops (safflower, *Pisum Sativum* L. and corn) a year[15]. The regions at an elevation of above 1600m should plant safflower with Yunhong 2 and 3 as main varieties, in order to further expand the space for increasing farmers' net income.

## 5 Discussions

Gray relational analysis method normalizes the original data, and this paper performs the gray relational analysis of per capita net income of farmers and various industries in the underdeveloped mountainous areas[7]. The results show that speeding up the adjustment of agricultural industrial structure is the most fundamental way to increase the per capita net income of farmers in the underdeveloped mountainous areas. This method is used to analyze the relationship between industrial development and industrial structure adjustment, with few calculation steps and strong operability. It can effectively guide the adjustment of agricultural industrial structure, and the normalization of the original data can be widely used in the gray relational analysis between the adjustment of agricultural industrial structure and farmers' net income growth.

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