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FUNGICIDAL PROPERTIES OF DISINFECTANT "DZPT-2"

Yaroshenko M.O., Zavgorodniy A.I., Paliy A.P.

National Scientific Center "Institute of Experimental and Clinical Veterinary Medicine", Kharkiv

Balym Yu.P.

Kharkiv State Zooveterinary Academy

*The results of determination of fungicidal properties of disinfectant "DZPT-2" concerning test cultures of the genus *Aspergillus*, which were applied on the test-objects, are presented in the paper. There has been found that disinfectant "DZPT-2" in 3.5% concentration contributes significantly delay in the growth of test cultures *A. fumigatus*, *A. flavus*, *A. niger*, and 4.0% solution of the preparation shows fungicidal properties.*

GMP + FSA SCHEME AS PART OF THE INTEGRATED SYSTEM FOR PROVIDING BIOSECURITY IN ANIMAL PRODUCTION

Žikić D., Ušćebrka G., Stojanović S., Kanački Z.

Faculty of Agriculture, Novi Sad

Introduction. *Many food-related crises in the past has clearly shown that the feed is a significant potential health risk and significantly affect the safety of foods of animal origin. The first principle is the biosecurity entry of disease on a farm. A feed is recognized as one of the sources of danger of the first principles of biosecurity in addition to new entrants-individuals, people, wildlife, and more. As for food, there is no possibility of quick and effective controls on entry to the farm or preventive measures (either ready-made food or raw material input for feed production on the farm), during the past twenty years, using different standards general and quality systems (ISO 9001; ISO 14001, ISO, 22000; Hazard Analysis Critical Control Point System - HACCP, Good Hygiene Practice - GHP; (Good Manufacturing Practice - GMP, Good Laboratory Practice - GLP), the attempted solution to this problem [1]. Of all the listed standards and systems, which have general character, only the GMP standard for feed specializing standard, which existed since 1992. Today, the respect and application of GMP + scheme provides the highest possible level of feed safety and safe way to prevent illness or incident, the final animal product (meat, milk, eggs) when it comes to food.*

Application of systems and standards of quality in the feed production. The role of the European Union is more directly focused on the key parts of the Common Agricultural Policy (CAP), the completion of internal commerce, consumer protection, health and measures to protect the environment of animals [2]. Starting from the new approach adopted by international organizations such as (FAO - Food and Agriculture Organization, WHO - World Health Organization, OIE - Office International des Epizooties, the International Organization for Standardization – ISO), and relying on the starting point - the Codex Alimentarius, European regulations on food, veterinary and phytosanitary regulations, integrated food safety system is the basis which includes the general principles of quality management and HACCP systems [3, 4].

The aim of the application systems and standards in the feed production are delivery of feed that is safe for consumers of animal products, animal feed and the environment in a way that causes the trust of all participants in the chain - producers, consumers and government. The main issue in the feed industry is how to ensure security. It is certain that the feed industry, including suppliers of raw materials for feed, is an important part of the food chain and to bear a significant share of responsibility for safety. The trade sector wants to product safety is easily verifiable and be assured throughout the entire production chain, including animal feed industry. For this reason, animal production in the nineties began implementation of an integrated quality control within the chain, which applies particularly to control the use of drugs, the conditions in which animals are bred and quality control of animal feed. Instead of expensive end-of-control, attention is turned to control various critical steps in the production process [5].

One of the first system that reflects this approach is HACCP system that has become synonymous for food safety. In essence it is a model for quality management (ie, quality control), or quality management (latest access) in the production and distribution of food [6]. In essence, the HACCP system is scientifically based, rational and systematic approach to identify, assess and control risks in the process of production, processing, application and use of food, and in order to ensure that food is safe for consumers and does not constitute unacceptable risk to health. In addition to improving food safety, other advantages of this system include efficient implementation and utilization of all resources, savings and timely response to problems related to food safety.

In order to connect systems and standard compatibilities (HACCP and ISO 9001 - QMS) and the absence of a single harmonized regulations in this area, the International Organization for Standardization (ISO) has developed new standards with the ISO 22000 designation, which was officially adopted in September 2005. [7]. The long-awaited ISO 22000 has made clarification of some concerns and problems. Only issue of certificates and certification under this standard is often caused by customers, so that when we speak of free will it is conditional. The second dilemma by this standard: whether to be represented and the best, most expensive technology, new methods, this standard is not prescribed, but suspended the improvement of food safety management system is at the highest level using the latest technology and methods of risk analysis.

Implementation of previous systems and standards, in terms of their general character, not a guarantee of the highest possible level that produced by the principles of animal feed have the greatest possible level of security by an animal that consumes it and no animal products at the end. The solution of this problem can be and GMP + standards for feed, which has existed since 1992 [4].

GMP + FSA scheme and feed production. GMP standard sets requirements for the quality system as well as numerous additional control measures for production, trade and transport of raw materials and food, with special reference to the supplements, undesirable substances and microbiological safety. Crises related to food safety (BSE, dioxin, *E. coli*) have led to a strong need for improvement of quality. This has resulted in:

- a) integration of the HACCP INTO GMP standard and
- b) the introduction of mandatory quality control for all suppliers of raw materials for feed.

Розділ 4. Розробка та виробництво ветеринарних імунологічних препаратів. Контролювання якості, випробування, стандартизація, сертифікація, маркетинг і провайдинг ветеринарних імунологічних препаратів

The quality system used in food production that proved to be efficient, adapted to the needs of industry feed. We also have to underline that the feed is part of the food chain [8] and this fact has grown into a motto "feed for food". The most important point for this program are:

- food safety is a high priority worldwide;
- animal feed industry, including suppliers of raw materials, is an integral part of a chain of food and is responsible for the safety of its products;
- the possibility of proving the quality and transparency of the system results in a license for the product;
- HACCP is a proactive approach that connects the feed with the food chain;
- quality control of raw materials is a common concern and suppliers and producers of food for animals;
- trade and industry are jointly responsible for product safety.

Based on the various requirements in the field of quality control of feed, Board manufacturers feed the Netherlands developed the GMP+ standard for feed in 1992, and the quality management system for food for animals. Mentioned GMP+ standard is one of the most important elements of the whole program on the quality of feed. Farmers who are involved in this program are directed to procure feed for the animals only from GMP-certified suppliers. More than 95% of Dutch suppliers of compound feed or feed ingredients have been GMP+-certified, and more and more German and Belgian suppliers of feed adjusted their production with this standard. Since 2010 the GMP + FSA scheme is managed by the GMP + International, a nonprofit organization based in The Hague [9].

The basic elements of GMP+ FSA schema are chain approach, prerequisites, product standards, traceability, monitoring, EWS system and process control [10].

GMP+ FSA is chain system. As part of whole chain, you can not to control all hazards in the chain yourself. Every link is responsible for feed safety with motto „a chain is only as strong as its weaest link“. According with that, GMP+ has strict purchase requirements. For all products and services must be specification of all products and services, selection of suppliers – based on HACCP risk assessment, verification of products and services, re-assessment of suppliers. For feed ingredients purchase, supplier neet to be GMP+ certified and for region with „low GMP+ density“ risk assesment must be based on individual system of suplier control. The aim of prerequisites is to create a basic hygiene level in the company. Elements of a Prerequisite Programme (PRP) are education and treining, infrastructure, bilding and working environment, facilities and equipment, cleaning and maintenance, pest control, administration and registration. Product standards is document in which a given level for undesirable substances (heavy metals, pesticides, microbiological substances, dioxine and PCBs,...) and residues from medicines. Compliance with these standards provide feed safety. The objective of an EWS or Early Warning and Response System (EWS) is the early detection and reporting of irregularities in (raw materials for use in) animal feeds and to allow rapid response and communication throughout the animal food production chain, with the aim of preventing or limiting the harmful consequences for man, animals and the environment.

Second important point of GMP+ FSA schema are documents. The documents within the GMP+ FSA scheme are subdivided into a number of series (A, B, C and D). A-documents are general (framework) documets. 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-documents are normative. 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-documents present certification requirement. 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-documents are interpretations and accompanying texts.

The part of B-documents are GMP+ standards. GMP+ standards are defined for all area as production, storage and transhipmnet, trade, transport, quality control. The main standard is GMP+ B1 [11]. This standard have identical structure to ISO9001 and ISO 22000. That is reason for easy integration GMP+ standards in existing quality management or food safety standard in company. GMP+ standards covers all scopes but especially production of compound feed and premixtures. Other GMP+ standards, like GMP+ B2, B3, B4, etc have specific, limited scope, but basic chapters are identical – QMS, HACCP, Prerequisites. Differences are in specific chapter for specific activities.

The Feed Safety Database (FSD) is an interactive database which is part of the GMP+ FSA Scheme. The FSD comprises various parts of the GMP+ FSA scheme: risk assessments, monitoring results, product standards and fact sheets. All the feed materials in the FSD are considered to be controllable and can therefore be used (safely) in the feed sector. The aim of FSD is to support GMP+ implementation. That base is source of different information: 120 generic risk assessments for 500 feed materials, monitoring results, fact sheets relevant to undesirable substances and processing aids, product standards. The benefits of use are up-to-date knowledge of risk of feed materials, assessed by independent experts, uniform source of knowledge and automatically linking of all relevant files.

Curent situation in Serbia and GMP + implementation. Production of animal feed is regulated by law in Serbia. Several laws and regulations governing this area, namely the Law on Veterinary [12, 13] and Food Safety Law [14]. Regulations arising from these laws are in compliance with European regulations in this field. According to the current regulations, a manufacturer of feed required to maintain a system for ensuring safety of products introduced and maintained on principles of good manufacturing and hygiene practices and hazard analysis and critical control points in production (HACCP program) [12]. This is an open possibility for the implementation of different standards and systems (ISO 22000, GMP +,...) however, the majority of participants in the feed chain has implemented a HACCP system. The problem that occurs in them is inadequate Prerequisite Programme (PRP), which does not provide a sufficient level of biosecurity, as well as ignorance of the product standards. These two elements, as part of the GMP + standards provide a more complete implementation of a higher degree of security products, and therefore a greater degree of farm biosecurity [15]. Therefore, companies wishing to engage in export, are mostly conditioned by the demands of customers, initiated or implemented the GMP + standards [16].

In Serbia, currently, there are 7 companies with certified GMP + standards. Three are certified as producers of feed ingredients, and other transporters or as trader. The reason for such a small number of certified firms to be found in any of the following facts:

- low level of knowledge required standards and regulations in this area;

- low level of training of workers in the direct production;
- small investment in facilities and equipment;
- inadequate attitude toward feed production as an important source of possible contamination;
- lack of chain approach;
- Inadequate control of potential contaminants of food by accredited laboratories (dioxins, PCBs ,...).

Because the process of joining the European Union, Serbia has to literally and consistently apply European standards in the entire territory, linear for all manufacturers. Raising awareness that the feed is an important link in the production of food is the obligation of states and other interested organizations (food producers, animal breeders' associations, dairies, slaughterhouses ...). GMP + standard, internationally recognized as a schema can be a good choice for all participants in the chain of feed that provides higher levels of product safety, biosecurity and therefore the farm level, which results in safer and more profitable production of food for human consumption.

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GMP + FSA СХЕМА, ЯК ЧАСТИНА КОМПЛЕКСНОЇ СИСТЕМИ ЗАБЕЗПЕЧЕННЯ БІОБЕЗПЕКИ У ТВАРИНИЦТВІ

Žikić D., Ušćebrka G., Stojanović S., Kanački Z.

Університет Нови Сад, сільськогосподарський факультет, відділення ветеринарної медицини, Сербія

За останні двадцять років різні ситуації в ЄС і в світі (*Salmonella*, *BSE*, *E.coli* O157: H7, діоксини тощо) призвели до збільшення інтересу щодо кормів для тварин і безпеки харчових продуктів. Корми для тварин - це важлива ланка усього харчового ланцюга. Повинна бути гарантована якість кормів, а також здоров'я тварин і здоров'я споживачів продуктів тваринного походження. Метою даної роботи є показати можливість реалізації стандартів з безпеки кормів - GMP +, і продемонструвати досвід в реалізації цього стандарту.