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The Establishment of an Intelligent Monitoring and Early Warning System for Large-scale Breeding Animal Epidemics in Urban Planning Areas

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Abstract: Animal diseases seriously affect the healthy development of animal husbandry and public health safety. The purification of animal diseases in large-scale farms is an extremely effective measure to eliminate and control the occurrence of diseases. Master the key measures of animal disease purification, and continue to promote the purification work. To achieve the goal of preventing and controlling animal diseases by standardizing and institutionalizing. In this paper, an intelligent animal husbandry breeding monitoring and early warning system is designed according to the characteristics of the livestock growth environment. The system is controlled by STM32 and adopts GSM wireless communication module to monitor the livestock environment in real time and collect data through sensors. Epidemic disease is monitored. Research data shows that once an infectious disease occurs on a large-scale pig farm, it will cause very serious consequences. Based on laboratory test data analysis and learning from the relatively good pig farm experience of biosafety, the original immunization program was adjusted and optimized, and the intelligent monitoring safety system was improved. The experimental results showed that the positive rate of blue ear antibodies in sows was 76%, and the average value of antibodies was 1.13; the positive rate of blue ear antibodies in boars was 99%, and the average value of antibodies was 1.22; the positive rate of blue ear antibodies in finishing pigs was 26%., The average antibody is 0.488; the positive rate of blue-ear antibody in nursery pigs is 18%, and the average antibody is 0.366. Therefore, the establishment of an animal disease monitoring and early warning information platform, combining animal disease monitoring information, laboratory testing services, quality system management, statistical analysis of monitoring results, animal disease early warning and predictive information management, can realize the informatization of animal disease monitoring and early warning Management, comprehensively improve the standardization level and early warning efficiency of major animal diseases.

1. Introduction

With the continuous development of computerization and networking and the application of various new technologies in recent years, the operation and management of urban systems have become more and more complex, and new tests on the level of complex urban governance are also in progress. On the one hand, to promote the construction of new smart cities, we must be guided by advanced urban governance. On the other hand, we must continuously improve the ability of perfect urban governance to meet people's growing demand for a better life. The information integration and data sharing provided by the construction of smart cities can not only promote the coordination of information sharing and management between government departments, but also promote the sharing of information and data between the government, the market, and the society. It can effectively promote the development of the city's economy. sustainable development. For example, in the field of health, the proliferation of electronic medical records and health records will promote the comprehensive utilization of large-scale high-quality medical resources, and promote the development of smart hospitals and telemedicine industries.

In modern agriculture, animal husbandry is an important component, which will directly affect the effectiveness of agricultural development, and indirectly affect the development of the national economy. In recent years, the state has issued many support and support policies for the development of animal husbandry, which has promoted the sound development of animal husbandry. The breeding method has gradually changed to a standardized and large-scale breeding method. The emergence of a large number of large-scale breeding farms has greatly promoted the development of the breeding industry. However, among large-scale farms, an important issue that cannot be ignored is disease. Once a disease breaks out, it may cause large-scale livestock deaths and cause serious economic losses. Therefore, in large-scale breeding farms, it is of great significance to improve the intelligent disease monitoring and early warning system [1-2].

Caragliu et al. conducted a quantitative analysis of the influencing factors of smart cities. On the one hand, the important role of innovation ability in smart cities is reflected in the attention to education level and urban environment level, and the use of administrative departments and various departments. This is reflected in the degree of utilization of administrative departments and the interconnection in various ways [3]. Naphade and others have explored the fundamental driving force behind the emergence of smart cities from four aspects: environmental sustainability, technological progress, economic growth and urban progress, and then proposed that innovative planning, operation and management will effectively promote urban smartness; A number of projects under construction have thoroughly analyzed the opportunities and challenges faced by urban intelligence [4].

Large-scale animal epidemic outbreaks will not only have a certain degree of adverse effects on the growth and development of the animals themselves, but also cause serious economic losses, and even threaten human health. Therefore, effective monitoring and early warning of animal diseases is particularly important. In this experiment, the intelligent monitoring system is used to monitor the immune level of different vaccines in order to understand the immune status of the pig farm after pathogen detection. The experimental results showed that the positive rate of blue ear antibodies in sows was 76%, and the average value of antibodies was 1.13; the positive rate of blue ear antibodies in boars was 99%, and the average value of antibodies was 1.22; the positive rate of blue ear antibodies in finishing pigs was 26%., The average antibody is 0.488; the positive rate of blue-ear antibody in nursery pigs is 18%, and the average antibody is 0.366.

2. Research on the Construction of Intelligent Monitoring and Early Warning System for Large-Scale Breeding Animal Epidemic Disease in Urban Planning Area

2.1. The Basic Path to Build a Smart City Governance System

Through the combination of high-level planning, collaborative processes and analysis of urban functional service needs, a five-in-one smart city governance command center of "perception, service, supervision, evaluation and analysis" has been constructed, and complete solutions have been proposed. The first is to determine the location of the center and establish a center that can support and manage the city's safety operations, emergency command and dispatch, social management, and government public services. The second is to determine the organizational structure of the center. The central overall structure that adapts to the actual situation of the city covers the overall structure design of the city's comprehensive data sharing platform, command and decision-making, city administration, public service and social administration, supervision and evaluation. The third is to determine the technical architecture. Design the technical architecture of the smart city management and operation command center, as well as the specific content of the entire smart city's perception layer, transmission layer, knowledge layer and application layer. The fourth is to determine the application architecture. According to urban functional requirements, design several key applications of smart city management and construction, such as urban comprehensive management and control applications, public service applications, social management applications, intelligent decision-making assistance applications, and high-level supervision and assessment applications [5-6].

2.2. Problems in Epidemic Prevention of Large-Scale Farmed Animals in Urban Planning Areas

(1) The breeding site does not meet the requirements of animal epidemic prevention

The layout and equipment of some standardized breeding park buildings do not meet the requirements of animal epidemic prevention. First of all, because the production area, living area, work area and foreign customer reception area are mixed, effective isolation cannot be achieved, and there is no animal disease isolation observation/treatment area in the production area, which easily leads to the spread and outbreak of diseases. Secondly, the purpose of disinfection and epidemic cannot be achieved, because disinfection facilities are not installed at the entrances and exits of livestock and poultry farms, or disinfection facilities cannot meet the requirements of animal epidemic prevention[7-8].

(2) Chaos in animal immunization procedures

For the immunization of animals in standardized-scale breeding parks, some use single vaccines and some use combined vaccines; commonly used vaccines are: swine fever single vaccine or pig “triple” vaccine, W vaccine, parvovirus and other diseases (bacteria).)seedling[9-10].

(3) The source of animal immunization vaccine (bacteria) is complicated

In a standardized-scale breeding park, the source of infectious (bacterial) vaccines used to prevent animal epidemics is very complex. Only a few breeders need time to order from the Animal Infection Control Department. Most other breeders buy from the veterinary drug and feed market, some from the county veterinary drug and feed supplier, and some through the breeding "owner". At present, there are several cases of failed immunization in individual farms[11-12].

(4) There are hidden dangers of major epidemics

In some breeding gardens of standardized sizes, infectious (bacterial) vaccines are abused to prevent infectious diseases in farm animals, and measures to prevent leakage are taken. There are many infectious (bacterial) vaccines in vaccination, and infectious (bacterial) vaccines that have not been bought are being repurchased for injection (avian influenza, swine rabies, etc.). However, it usually fails to prevent livestock diseases and rabies, and these epidemic immune gaps can cause major epidemics[13-14].

(5) Abuse of antibiotic drugs affects animal epidemic prevention effect and product quality

Some standardized-scale breeding parks abuse antibiotic drugs during the breeding process. One is the excessive addition of feed and long-term use; the second is the double use of large doses during treatment; third, the use of high-dose antibiotics has a certain impact on the rescue of epidemic vaccination reactions, but it also interferes with infectivity (The beneficial viable flora of the (bacterial) vaccine affects the effectiveness of the infectious (bacterial) vaccine. Long-term use of large amounts of antibiotics will cause large amounts of antibiotics to stay in the animal body for a long time, thereby affecting the effectiveness of popular (bacterial) vaccines during vaccination and the quality of livestock and poultry products[15-16].

2.3. Insufficiency of the Early Warning System and Research on the Construction of An Intelligent Monitoring and Early Warning Information Platform

In recent years, the development of China's animal husbandry has accelerated. Although it has huge economic benefits, it is necessary to clearly recognize the hidden dangers of zoonotic diseases. In 2005, the first case of zoonotic disease occurred in my country, which is also called "avian flu". With the increase of the breeding scale, the distance between the animals and the animals is constantly shrinking, which increases the possibility of animal diseases spreading to humans. Zoonotic diseases not only seriously affect the development of livestock and poultry breeding, but also cause serious economic losses, seriously threaten human health and safety, and cause serious social problems[17-18].

At the same time, in order to maximize economic benefits, veterinary drugs are commonly abused in the process of raising animals. Excessive drug residues are also a serious threat to human health, which limits the continuous, healthy and rapid development of the breeding industry. Therefore, the establishment of animal disease monitoring and early warning systems is particularly important[19-20].

Although some large-scale farms have implemented animal disease purification early warning systems and achieved certain results, there are still many problems, such as unrealistic purification schemes, inaccurate monitoring methods, low monitoring frequency, and inadequate comprehensive measures. To achieve the desired effect. This article proposes a smart monitoring and early warning information platform construction plan based on the existing problems in the early warning system of today's farms:

(1) Inspection business management module

According to the business process stipulated by the center's quality management system, formulate inspection business management modules to realize the reproduction of business processes, including business acceptance, sample reception, processing, sample circulation, laboratory testing, laboratory review, and issuance and issuance of test reports, etc.; The system automatically records all business processes, automatically collects the test results of the microplate reader and PCR instrument, and automatically associates them with the original test records and test reports[21-22].

(2) Test result statistics and analysis module

1) Automatically search for all tests under these prerequisites by freely selecting time period, animal type, detection disease, detection method, detection site category, region, vaccine manufacturer, immunization times, immunization dose, animal age and other conditions Data is generated and summarized in tabular form[23-24].

2) Retrieve all sample information and test results within a certain period of time, and automatically generate a report report, including animal species, site category, quantity, feeding amount, sample number, individual qualified number, group number, group qualified number, etc.

(3) Early warning and forecasting module

Associate the monitoring status and early warning results of all monitoring outlets and monitoring customer information with the GIS map to realize the geographic early warning analysis function. That is, it is combined with the current dynamic distribution of livestock and poultry resources in Jiyuan City's livestock information system and the GIS map of the major animal disease prevention and control command and dispatch system, and information is shared. Various production factors are displayed on the city's electronic map and matched with the disease command and dispatch function. The city's livestock and poultry resources are inquired about the dynamic distribution and the rapid command and dispatch of the prevention and control of major animal diseases[25].

1) Dynamic distribution system for livestock and poultry breeding in the city

Mark and display the city’s dynamic breeding information of livestock and poultry products on the city’s electronic map. The map is divided into five layers: comprehensive, pig, cattle, sheep, and other layers according to the main breeding species. The data can be summarized in real time; when the breeding data is updated , The map is automatically updated.

2) The city's major animal disease emergency command and dispatch system

Using GPS coordinates or zooming in on the map, you can accurately mark the location of the epidemic, locate the epidemic area, and set the radius of the threatened area to automatically display the range of the threatened area. After locating the epidemic area and the threatened area, the system can automatically aggregate relevant information such as the number of farms in each area, the type and quantity of livestock and poultry. The electronic map dynamically displays the city's emergency and epidemic prevention material reserve information, including: the address of the reserve warehouse, contact information, and material types and stocks.

(4) Personnel, instrument and equipment management module

Establish electronic files of center personnel, equipment and equipment, realize automatic association of personnel qualifications, equipment and test items, set up automatic reminders of personnel qualification period, equipment verification, calibration period, etc., and implement online dynamic management.

(5) Management of reagents and consumables

Establish the management of reagents and consumables in and out of the warehouse, set the bottom line for storage, and automatically remind the library to add; and automatically associate the inventory information of reagents and consumables with the detection task. If a certain detection reagent is lacking, the detection task cannot be generated. The temperature sensing probes connected to the refrigerators and freezers that store reagents are connected to the system. When the temperature is lower or higher than the specified temperature, the abnormal or error information will be transmitted to the reagent manager through the system in time, reminding and handling in time.

(6) Environmental management

It can perform dynamic monitoring of the environment, incubator, and refrigerator, and automatically import the environmental data of a specific area or laboratory, including real-time data such as temperature and humidity, for the synthesis of original records. Environmental management requirements are linked to the inspection process. The construction flow chart of the intelligent monitoring and early warning information platform is shown in Figure 1.

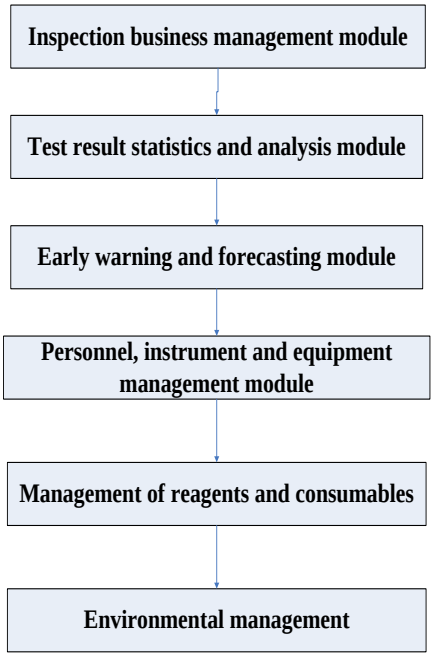

Figure 1. Flow chart of the construction of intelligent monitoring and early warning information platform

An efficient and fast intelligent information monitoring system can greatly enhance the efficiency of animal disease prevention and control. Therefore, based on the current information platform, establish a comprehensive and efficient animal disease information processing platform, and establish monitoring stations in various places., Collect all kinds of epidemic information and ensure accuracy. Realize efficient transmission of disease prevention and control information, strengthen the construction of information terminals, collect disease information and processing methods from other regions and foreign countries, build a special animal disease information database, and conduct detailed records and analysis of epidemics that have occurred, for future epidemics Lay the foundation for monitoring and prevention and control work, thereby improving the emergency response ability to the outbreak. In addition, a scientific emergency plan must be established. Because the occurrence of animal diseases is highly unpredictable, various response plans must be formulated in detail to estimate the scope and extent of the outbreak, so as to scientifically allocate resources. Make adequate preparations for medicines and equipment, especially in concentrated and large-scale breeding areas, slaughter and sales sites, and make adequate material preparations so as to respond quickly and deal with it in time when an epidemic occurs.

2.4. Analysis of Countermeasures for the Establishment of an Animal Epidemic Monitoring Pre-Swear System

To speed up the establishment and gradually improve the animal epidemic monitoring and early warning system as soon as possible, this article suggests that efforts should be made from the following aspects:

(1) Increase capital investment

The establishment and improvement of animal epidemic monitoring and early warning systems require substantial financial support. A lot of funds are needed to improve different infrastructures, deploy different advanced equipment, and apply different detection methods. This is far from being

solved by government funding, so it also requires social financial support. Therefore, relevant departments can not only obtain specific economic benefits through their own efforts, but also seek more support from the company.

(2) The introduction of talents

Judging from the current situation, only people have subjective initiative, but this is an undeniable fact. However, the current situation is that team members do not have high professional knowledge and the overall quality of human resources is not strong. To this end, it is necessary to speed up the recommendation of professionals and add more professional and highly qualified personnel to the team. The other is to increase the training of existing human resources, such as professional ethics and comprehensive business literacy, so that they can play a more active role in each position and make greater contributions.

(3) Further increase publicity

Relying on the media and doing well in publicity and advertising are particularly important for the effectiveness of animal surveillance and early warning. Such advertisements should target livestock farmers, processors and society as a whole. Through public relations, let everyone have a deeper understanding of the impact of animal epidemics, and then prevent animal diseases. This is not only a requirement of relevant departments, but also to ensure the economic benefits of animal breeding, and at the same time promote social development; through propaganda, the work of relevant departments will be more recognized and supported, and when actual work is carried out, it will naturally More convenient.

2.5. Overall Design of Intelligent Monitoring System for Large-Scale Breeding Animal Epidemic Sources in Urban Planning Areas

Monitoring the environment of animal husbandry is particularly important, because the foci of farmed animals are closely related to the environment. According to the characteristics of the growth environment of the breeding animals, a set of intelligent animal husbandry epidemic monitoring and early warning system was designed. This system is mainly controlled by STM32, and uses GSM wireless communication module to monitor the livestock environment in real time and collect data through sensors. The STM32 microprocessor is used to process the data collected by the sensor and display it on the display. The microprocessor makes decisions based on real-time environmental parameters, and informs the result of the decision through GSM phone or short message. The administrator takes corrective measures according to the specific situation. The intelligent system can achieve the purpose of early warning as soon as possible. The system has low cost, is easy to operate and effectively manages the growth environment of livestock.

(1) System communication module

The core part of this system is the GPRS module (GSM module). GPRS is a circuit board that integrates the functions of call, data transmission, and SMS. STM32 MCU communicates with GPRS through RS 232 serial port, enabling GPRS to realize wireless communication function. At the same time, the GPRS module also has a data transmission function. When the sensor detects the current environmental parameters, the system immediately determines whether the current parameters are within the safe range, predicts the time when the danger will occur, and sends the current parameters to the administrator via SMS.

(2) Overall design of intelligent system

This system uses a comprehensive environmental monitoring sensor (CO concentration sensor, O2 concentration sensor, NH3 concentration sensor, temperature and humidity sensor), the sensor is installed indoors, can monitor the growth environment of livestock, 24 hours monitoring. The data collection function is realized by sensors, and equipment such as fans, humidifiers, lighting

equipment and heating are installed to create a good environment for the growth of livestock. When the device detects that the environmental parameters are about to exceed the safety limit, it can contact the administrator through the GSM wireless communication module and send a short message to notify the administrator to pay attention to the environmental parameters. When the device detects that the environmental parameters are not within the safe range, it will immediately send out an alarm, GSM sends a text message and calls the administrator, and informs the administrator to take corresponding measures. Figure 2 shows the operating process of the system.

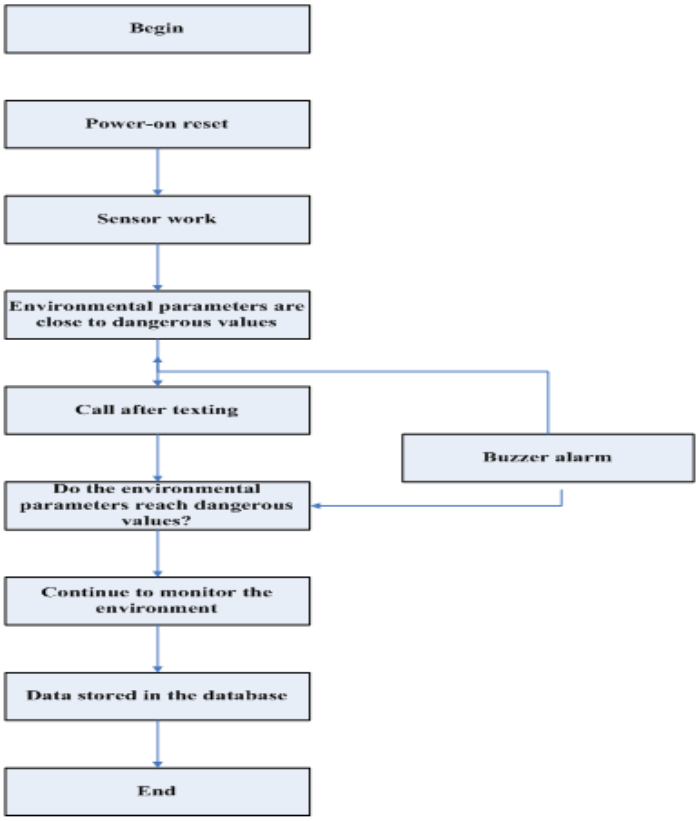

Figure 2. System operation steps

(3) Software design

The system uses STM32 as the core processor, controls the sensor through the STM32 microprocessor to complete data collection, and displays data in real time through the serial port. The administrator sets the environmental parameters according to the environment where the livestock is located, and divides them into three levels: safety range, close to epidemic risk range and epidemic range. The microprocessor makes decisions based on real-time environmental parameters, and the judgment results will be notified to the administrator by means of text messages, allowing the administrator to take countermeasures in time.

2.6. Design of Livestock Action Recognition Algorithm

After obtaining the relevant movement information data of the daily behavior of the livestock, it is necessary to analyze the difference of the movement information of the different movements of the livestock, so as to design the corresponding algorithm to realize the recognition of the different movements of the livestock. In the experiment, the K-means mean clustering algorithm was used to

analyze the acceleration data of the livestock motion sensor, so as to identify the different behaviors of the livestock.

Since each axis of the acceleration sensor changes significantly during movement, the acceleration

According to the modulo processing, the calculation formula is shown in formula (1):

$$a = \sqrt{ax^2 + bx^2 + cx^2} \tag{1}$$

a represents the acceleration of the three-axis integration, and ax, bx, and cx respectively represent the original value of the three-axis acceleration. Generally, the repetition frequency of animal movements is between 0 and 20 Hz, and certain errors will be generated during data collection. Therefore, it is necessary to filter the motion sensor data to smooth the waveform to filter out noise. This article uses Gaussian filter to filter , One-dimensional Gaussian filtering generates the weights of points in the specified field through the following one-dimensional zero-mean Gaussian function, formula (2) is as follows:

$$a_{filted}(t) = \sum_{\tau=1}^{s-1} e^{\frac{t^2}{2\sigma^2}} * a(t) \tag{2}$$

a(t) is the signal collected by the motion sensor, afilted is the acceleration signal after Gaussian filtering, and the parameter determines the smoothness of the waveform. Gaussian filtering uses Gaussian distribution to make the weight of the center larger than that of adjacent points, which can better retain the original waveform peaks and valleys after filtering.

3. Experiment on the Construction of Intelligent Monitoring and Early Warning System for Breeding Animal Epidemic Disease

3.1. Experimental Samples

In this experiment, the sick pigs submitted for inspection were firstly subjected to necropsy to observe the ocular lesions in the internal organs and other parts, and then the lungs, lymph nodes, brain and other parts of the sick pigs were taken, fixed with 4% formaldehyde solution, routinely paraffin sectioned, HE stained, and observed under light microscope .

3.2. Experimental Setup

Monitoring the condition of livestock farms is particularly important, because changes in the size and location of livestock breeding may have a significant impact on livestock growth. In this experiment, according to the characteristics of livestock growth environment, a set of intelligent epidemic prevention monitoring and early warning system was designed. The experimental system uses STM32 as the main control and GSM wireless communication module to monitor the livestock environment in real time and collect data through sensors. The STM32 microprocessor is used to process the data collected by the sensors and display it on the display.

4. Discussion on the Construction of Intelligent Monitoring and Early Warning System for Breeding Animal Epidemics

4.1. Analysis of Antibody Test Results

(1) To ensure the safe and stable operation of the system, it is not only necessary to strengthen

the control of animal husbandry information, but also to perform simple operations on the animal husbandry environment to increase the interest of the livestock farm. After detecting the pathogens of the farm through the intelligent monitoring system, in order to understand the immune status of the pig farm, it also monitored the immune level of different vaccines. A total of 60 samples were sampled, including 20 for sows, 10 for boars, and 20 for fattening. 10 copies of nursery pigs. The antibody test results are as follows: Figure 3 shows that the swine fever antibody qualification rate of sows is 88%, of which the blocking rate ⩾50% is 76%, the average blocking rate is 72.22%, and the dispersion is 35.81%; The pass rate of swine fever antibodies for boars is 100%, of which 88.3% has a blocking rate ⩾50%, the average block rate is 77.03%, and the dispersion is 22.56%; the pass rate of swine fever antibodies for finishing pigs is 75% Among them, the blocking rate ⩾ 50% is 65%, the average blocking rate is 63.27%, and the dispersion is 36.21%; the positive rate of hog fever antibodies in conservation is 50%, and the blocking rate ⩾50% is 12% , The average blocking rate is 42.77%, and the dispersion is 48.82%.

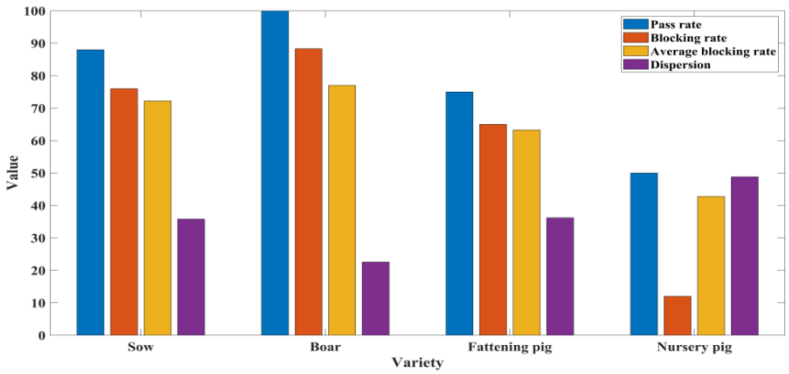

Figure 3. Swine fever antibody levels in different swine herds

(2) According to the environmental characteristics of livestock growth, this experiment uses sensor technology to collect real-time breeding environment parameters using sensors such as CO concentration, O2 concentration, NH3 concentration and environmental temperature and humidity, and designed an intelligent animal husbandry breeding disease monitoring and early warning system. Once an infectious disease occurs on a large-scale pig farm, it will cause very serious consequences. According to the results of the detection of pig blue-ear antibodies by the intelligent monitoring system, it can be seen from Figure 4 and Table 1 that the positive rate of blue-ear antibodies of sows is 76%, and the average antibody is 1.13; the positive rate of blue-ear antibodies of boars is 99%. The average value is 1.22; the blue-ear antibody positive rate of fattening pigs is 26%, and the average antibody is 0.488; the blue-ear antibody positive rate of nursery pigs is 18%, and the average antibody is 0.366.

Table 1. Antibody levels of PRRSV in different pig populations

	Positive rate	Average Value
Sow	76%	1.13
Boar	99%	1.22
Fattening pig	26%	0.488
Nurserypig	18%	0.366

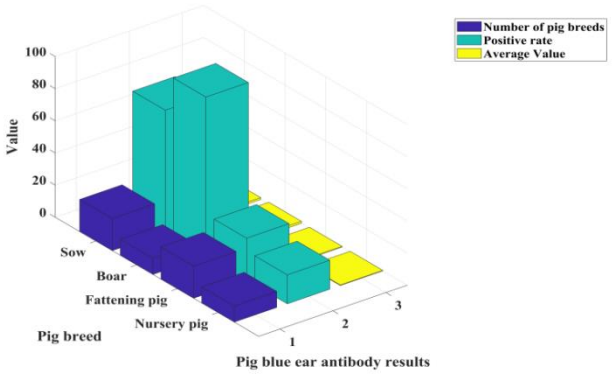

Figure 4. Antibody levels of PRRSV in different pig populations

4.2. Analysis of the Monitoring Results of Pseudorabies Pigs

(1)The microprocessor makes judgments based on real-time environmental parameters, and immediately informs the livestock farm manager if there is an abnormality. This experiment found abnormal pigs. The results of wild pseudorabies virus antibody after monitoring are shown in Figure 5 and Table 2. The positive rate of pseudorabies gE antibody in sows is 99.8%, and the average antibody is 0.112; the gE of pseudorabies in boars The antibody positive rate was 37.6% and the average antibody was 0.622; the positive rate of pseudorabies gE antibody in finishing pigs was 38.9%, and the average antibody was 0.586; the positive rate of pseudorabies gE antibody in nursery pigs was 99.1%, and the average antibody was 0.093 .

Table 2. Pseudorabies gE antibody levels in different pig herds

	Positive rate	Average Value
Sow	99.8%	0.112
Boar	37.6%	0.622
Fattening pig	38.9%	0.586
Nurserypig	99.1%	0.093

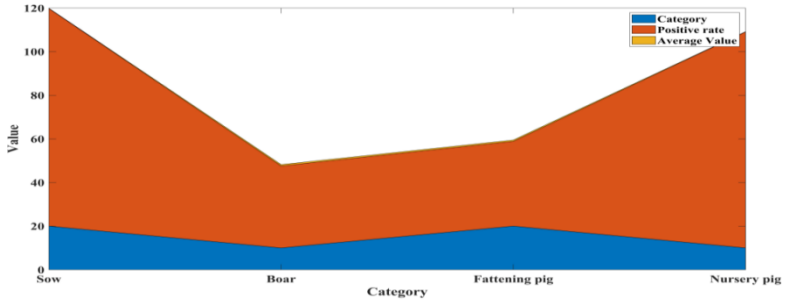

Figure 5. Pseudorabies gE antibody levels in different pig herds

(2) The results of monitoring pig pseudorabies gB antibody are as follows. Figure 6 shows that the positive rate of pseudorabies gB antibody in sows is 99.4%, the average antibody is 0.092, and the dispersion is 91.32%; the positive rate of pseudorabies gB antibody in boars The positive rate of

pseudorabies gB antibody in nursery pigs was 99.5%, the average antibody was 0.168, and the dispersion degree was 81.22%; the positive rate of pseudorabies gB antibody in piglets was 99.8%. 99.2%, the average antibody was 0.087, and the dispersion was 104.56%.

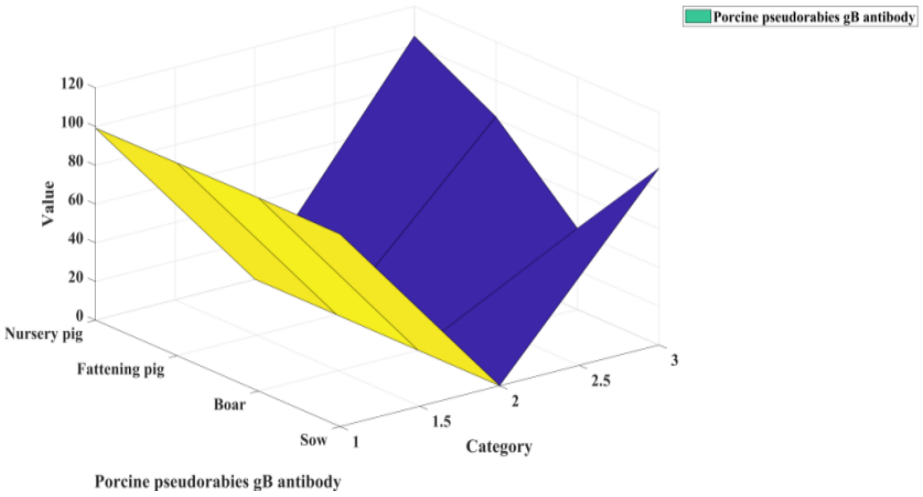

Figure 6. Pseudorabies gB antibody levels in different pig herds

5. Conclusion

(1) Under the guidance of the concept of smart city governance system, to comprehensively improve the "smart city governance system", the following points are required: First, study and improve the policy and regulation system, standard norm system, information resource sharing system, and information security of smart city governance Legalization and institutionalization, etc. The second is smart city governance, including diverse urban governance systems, leadership coordination and promotion mechanisms, inter-departmental coordination mechanisms, the responsibilities of city management authorities, the institutional setting of citizens participating in city management, and various organizations. It is to study and determine the system design plan. The third is to study the smart city governance evaluation index system, incorporate the effectiveness of city governance into the performance evaluation of relevant departments and regions, and coordinate the promotion of smart city governance construction.

(2) From the discussion in this article, it is not difficult to understand the importance and necessity of accelerating the detection of animal diseases and establishing an early warning system, but this is not achieved overnight. To this end, we must first establish an advanced concept and realize the importance of completing this work correctly, and then implement various measures, continue to work hard, continue to innovate, accelerate the construction of the animal epidemic monitoring system, and truly give full play to its due The positive effect of At the same time, it is necessary to effectively ensure the economic interests of farmers, ensure the health and safety of human beings, and realize the sustainable, healthy and rapid development of animal husbandry.

(3) The outbreak of livestock and poultry diseases has strong regional and endogenous characteristics. The prevention and control measures and control modes of large farms in different regions are different, and the occurrence of major animal diseases is not only related to biological factors, but also to social factors. This experiment uses an intelligent monitoring system to monitor the immune level of different vaccines after pathogen detection in order to understand the immune status of pig farms. The experimental results showed that the blue-ear antibody positive rate of sows was 76%, and the average antibody was 1.13; the blue-ear antibody positive rate of boars was 99%, and the average antibody was 1.22; the blue-ear antibody positive rate of fattening pigs was 26% ,

The average antibody is 0.488; the positive rate of blue-ear antibody in nursery pigs is 18%, and the average antibody is 0.366.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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