FEED AND ANIMAL PRODUCTS SAFETY CONTROL

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ABSTRACT

This study aimed to rate harmful status in feed and animal products; investigate current breeding, slaughter and for-sale status

- Survival analysis of residual toxic substances in mixed feed, pork meat and liver samples showed that the average content of salbutamol in animal feed was 639.77 ppb; clenbuterol and salbutamol in meat samples, pork liver in the retail market in Dong Nai were 26.66% and 50% respectively. Sudan and ractopamin were not found in animal feed samples.

- Micro-organism analysis results in pork meat of the slaughterhouses and meat shops on the market are still higher than TCVN 7046:2002 in a few targets.

The weak management at the unit and local levels should be strengthened in order to meet the state regulations on hygiene and food safety.

Key word: Pigs, feed, meat, liver, salbutamol, clenbuterol, antibiotics, microorganism, heavy metals, sudan.

1. INTRODUCTION

Hygienic food safety is one of the social importance problems because of its relation directly to public health. Many of food poisoning have been recorded in the food kitchens. Many cases in the industrial zones recently have been ringing tone to alert on this issue for the whole society. There are many reasons making food unsafe for use as acute poisoning due to food contamination of microorganisms causing disease and toxicity because of antibiotics (hormone, toxic mushroom, heavy metals). Antibiotic residues in food can make the bacteria resistant to drugs, cause cancer, disorders of physiological functions of the body as it gradually accumulates in the human body and becomes the latent risk. Hormone residues in food cause an abnormal change of body development causing gene alteration-a risk of cancer. β-agonist such as clenbuterol, salbutamol residues in product may cause the fast heart beating, nerve stimulation during many days.

According to research results in the markets, almost animal products did not meet the standard of hygiene and safety food. Most of meat samples were infected all kinds of micro-organisms such as *Clostridium perfingens*, *Staphylococcus aureus*, *Salmonella*, *E. coli* with many times higher than VN standard.

The national research program aimed to draw out scientific solutions to control the root causes of unsafe food hygiene, from which to build models of safety from animal husbandry, slaughter, processing and distribution.

2. RESEAECRH CONTENTS AND METHODS

2.1 Assessing the actual contamination status of toxic substances in feeds and animal products.

2.1.1 Hormone analysis

- Screening method (clenbuterol, salbutamol) using quick test kit.
- Quantitative determination of clenbuterol content by ELISA method (with positive samples after quick testing)
- Quantitative determination of salbutamol content by ELISA method (with positive samples after quick testing)
- Quantitative determination of ractopamine by HPLC

- Quantitative determination of clenbuterol by GC-MS.
- Quantitative determination of salbutamol by GC-MS.

2.1.2 Heavy metals analysis (Zn; Cu; Pb; Hg; As)

2.1.3 Sudan analysis

2.1.4 Antibiotics analysis (chloramphenicol, furazolidon)

3. RESULTS AND DISCUSSION

3.1 Analyzing of toxic substances in feeds and animal products.

3.1.1 Screening method for hormone analysis

There were 12 positive samples out of 500 tested samples accounting for 2.4% (14.06% in the North and 0.69% in the South).

Table 1. Quick test results

Type of samples	Total samples	Positive samples	Percent (%)
Mixed feeds	500	12	2.4
Pork meat	20	3	15
Liver	10	5	50

3.1.2 Quantitative determination of growth promoter hormones

a/ ELISA method

Based on the results of quick tests, positive samples were continuously analyzed by ELISA method. The data on Table 2 showed that 100% of these samples contained both clenbuterol (2.25-13.45 ppb) and salbutamol (2.20 – 38.30 ppb)

Table 2. Clenbuterol and salbutamol contents by ELISA method (ppb)

Type of sample	Number of analyzed samples	Clenbuterol	Salbutamol
Mixed feeds	12	2.25-3.45	2.20-38.30
Pork meat	3	1.02-1.32	2.41
Pig liver	5	1.19-1.91	1.06-1.40

All of 3 positive pork meat samples contained clenbuterol (1.02-1.32 ppb), only one had salbutamol (2.41 ppb). For 5 positive liver samples, clenbuterol were detected in 4 of them (1.19-1.91 ppb) and the salbutamol content in all samples ranged from 1.06 to 1.40 ppb with ELISA testing.

b/ Confirmation of clenbuterol and salbutamol contents by using GC/MS

Table 3. Clenbuterol and salbutamol contents confirmed by GC/MS (ppb)

Type of samples	Number of samples	Clenbuterol	Salbutamol
Mixed feeds	12	-	4.44 – 7367.5
Positive suspicious mixed feeds	5	-	5.1 – 8.79
Pork meat	10	0.06 – 0.40	0.06 - 0.36
Liver	10	-	0.03 – 0.10

3.1.3 Ractopamine analysis

By HPLC checking, there was not existence of ractopamin in 36 samples of mixture feed . This is in line with our comments, because ractopamin have less popular in the country market actually.

3.1.4 Heavy metal analysis

Table 4. Heavy metal content in feeds (mg/kg)

Heavy metals	Number of samples	Positive samples	Concentration	Vietnam standard VN 838:2006
Zn	20	20	372	250
Pb	19	5	55	5
Hg	14	6	0.02	0.1
Cu	20	20	105	175
As	15	15	0.5	2

3.1.5 Sudan analysis

Analysis results of color product (Sudan I - IV) in 50 feed samples by HPLC showed that without presence of Sudan in feed samples.

3.1.6 Antibiotic analysis

Of the 80 samples in the mixture analysis method of Elisa were detected with chloramphenicol. Four of 110 samples analyzed using quantitative methods on the HPLC contained furazolidone with an average of 3.33 ppb (3.28-3.38 ppb).

IV. CONCLUSIONS

- β-agonist hormone has been still used in animal feed for stimulating growth. The rate of positive samples with hormone in the northern provinces is many times higher than southern ones. Average fraction of salbutamol in animal feed was 639.77 ppb, the lowest was 4.44 ppb and the highest was 7367.5 ppb.
- 100% of analyzed feed samples contained Cu, Zn and As; 26% of samples with lead (Pb) and 43% of samples with mercury (Hg).
- The rate of feed samples containing furazolidon was 4.0%, with an average rate of 3.33 ppb.
- Sudan ractopamin was not found in animal feed.
- Feed and drinking water for cattle and poultry are not closely control of quality
- There was not a closed control systems of slaughter, processing and for-sale.