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Detection of Antibiotics Residue in Chicken Meat Using TLC

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Abstract: Nowadays antibiotics are applying for control of infectious diseases in chickens digestive system. Incorrect use of this drugs deposits some residue in product. This research highlights the importance and existence of antibiotics residue in meat. In this survey 10 grams of chicken meat crashed and squeezed in 10 ml ethanol. After clarifying by centrifuge the solvent evaporated totally. After loading and running on silica F256 plates, the chromatograms observed on UV light. The results showed more than 50% of meat samples had noticeable antibiotics residue.

Key words: Antibiotics residue, TLC, chicken meat

Introduction

In veterinary pharmacology is a short discussion about common problems of livestock and human antibiotics. Incorrect applying of antibiotics deposits noticeable residue in meat, egg, milk, cheese, butter and other livestock products. Human as a non target organism of this drugs receives different amounts of them as residue which can cause private changes in his intestine microflora and elimination of some useful bacterial strains.

Another danger of receiving antibiotics residue is microbial resistance of body microflora to common antibiotics which may cause serious problems at microbial infections. There is some problems for soil microflora which receives antibiotics residue in birds manure (Lee *et al.*, 2000). Non detected effects of this problem in human communities is a wide spectrum resistance to antibiotics as a chronic effect.

An outcome of this process is necessity to new antibiotics for controlling infectious diseases of human who produces huge costs for governments (Kotretsu, 2004). In this study a simple and fast method was surveyed for detection of antibiotics residue in chicken meat tissues. Thin layer chromatography is a sensitive and exact method for monitoring low amounts of different biological and chemicals. Illumination of antibiotics against UV light helps as a simple detector for this mean.

Materials and Methods

Sampling: About 50 chicken corpses selected from different poultry slaughter houses and markets in Sari, Babol, Amol and Babolsar (Mazandaran, Iran). Predated migratory birds were used as check samples.

Antibiotics extraction: 10 gr of different tissues of

chicken corpses in 10 ml Et-OH 96° crashed and squeezed fine in a chinese mortar. The solvent transferred to 15 ml falcon centrifuge tubes and centrifuged at 7000 rpm for 10 minutes. The clear supernatant transferred to fresh glass test tubes and evaporated in contact with N₂ stream. After full drying the deposits resolved in 0.2 ml Met-OH. The samples were ready to point on silica plates (Tajick *et al.*, 2002)

Preparation of silica plates: Glass plates washed in acetone bath had 10 × 20 cm dimensions. For each plate 2 gr of Silica gel F256 (Merck, Germany) mixed in 5 ml DW and shaken thoroughly to produce fine paste. Clean glass plates coated with silica paste by TLC gel spreader system (Shandon, England) in 0.25 mm thickness. Plates activated in 120°C for two hours (Boyer, 1993).

Standard preparation: For comparison of extracted residues with raw antibiotics routine poultry antibiotics were prepared by dissolving of 0.1 gr of each powder in 4 ml methanol (Thangadu *et al.*, 2002).

Pointing, running and detection: About 50 µl of methanal dissolved deposits were pointed on silica plates Treated plates transferred to TLC tank containing acetone-methanol (1:1) as mobile phase. After receiving of solvent front to end of plates, chromatograms observed on UV light at 256 nm (Thangadu *et al.*, 2002).

Results

Investigation of different corpses showed most samples have variable amounts of antibiotics which were applied during growth period. Concentration of extracted liquid was an important stage in monitoring of residue. Pointing of centrifuged solvent on silica plates

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and concentrated solvent at different stages of evaporation (3/4, 1/2 and 1/4 of initial volume) made detection of antibiotics easy and easier. At final stage detection was too easy and soon.

Comparison of check samples with market and slaughter house selected samples showed there are no patches on plates for check but at least one for treatments. Similarities between Rf of detected patches from suspected samples with standards led us to sure there are near link and correlations between them. In some tissues like liver residue concentration was too higher (about 10 folds) than other parts of corpses.

Discussion

Poultry diet additives are non detachable part of poultry industry (Choma, 2003). Most of them have important roles in health and curation of chickens but incorrect use of additives specially drugs may have private problems for consumers (Al-Mustafa and Al-Ghamadi, 2000). It is obvious that drugs residue on livestock products specially milk and meat is an important problem in most countries (Levy, 1998; Gustavson *et al.*, 2002; Bertini *et al.*, 2003).

The importance of subject is too clear for food and veterinary specialists. Furthermore resistance in human microbes antibiotics may induce resistance in avian and livestock bacterial pathogens (White *et al.*, 2000, McKellar, 1998; Thal and Zervos, 1999). For escaping from this problem outcomes, basic and advanced education of poultry and livestock farm workers is necessary. More curations using analytical techniques is complement of reducing or eliminating drugs residue dangers.

Different methods are reported for detection of drugs residue in raw ex-farm products (Gustavson *et al.*, 2002; Kotretsu, 2004; Ramos *et al.*, 2003). Thin layer chromatography is a simple non expensive and exact technique which can execute easily in most laboratories. Among chromatographic techniques HPLC have high accuracy but have some limitations (Choma, 2003). For direct investigation of residues on poultry farms TLC have low costs, is fast and can analyze at least 10 samples at the same time.

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