



# Awareness of the Presence of Antimicrobial Residues in Foodstuff Among People in Taif Region, kingdom of Saudi Arabia

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**Abstract:** Antimicrobial drugs are widely used in farm animals to promote the growth and to increase the productivity, this is justified by the increased demand by the growing populations all over the world, but it has been proven by many studies that the misuse of these chemicals can cause diseases in humans which may include bacterial resistance and other disorders if misused, this study has been designed to evaluate the knowledge of the consumers in Taif region of the danger hidden behind this misuse, and to show there is a real need to educate the public on the danger hidden behind and inside our delicious, protein rich meals. 28% of the sample tested don't know that the presence of antimicrobial residues in food is harmful to their health, while 28% don't know that these chemicals could reach their bodies through the food they consume.

**Keywords:** Antimicrobial, Food, Meat Eggs, Resistance, Bacteria

## 1. INTRODUCTION

The use of antibiotics to enhance growth and feed efficiency and reduce mortality in broiler production was introduced without rigorous testing as to efficacy some 50 years ago [1] after the discovery of its growth promoting effect in farm animals in the mid-1940s after that and within five years the addition of GPAs became common practice [2].

The use of antimicrobials for the treatment or prevention of disease in animals closely followed their uses in humans [3], and today antimicrobial drugs are used to control, prevent and treat infection, and to enhance animal growth and feed efficiency [4].

The use of antimicrobial agents in food-producing animals has recently become a very important public health issue. These agents are being increasingly used for the prevention and therapy of infectious disease in farm animals raised under intensive husbandry methods of production. In addition, they are routinely added at subtherapeutic levels to animal feed for their growth-promoting properties [6]. These practices, however, have many negative effects, including developing of microbial resistance to these antibiotics, with the possible transfer of resistant pathogens from animals to humans. Furthermore, the presence of drug residues in animal products gave potential health risk to the public [5].

The World Health Organization, the American Medical Association, and the American Public Health Association have urged a ban on growth promoting antibiotics (GPAs) arguing that their use leads to increased antibiotic-resistant

infections in humans. In contrast, commercial interests have argued that their removal will have a significant impact on the cost of production and is unlikely to affect the risk to humans from antibiotic-resistant infections [1].

In many studies [7] antimicrobial residues in chicken tissues available for human consumption were found. In a study done in the eastern province in the Kingdom of Saudi Arabia [5]. Norofloxacin antibiotic residues were found in market-ready chicken muscle and liver tissues. Currently, approximately 80% of all food-producing animals receive medication for part or most their lives. This use of antibiotic drugs in food-producing animals may result in the presence of residues in meat and offal. Protection of public health against possible harmful effects of veterinary drug residues is a very important problem [8]. There is increasing public health concern, however, over the use of antibiotics for growth promotion in food animal production related to the contribution of this use to increasing rates of antibiotic resistance [9].

In a previous study [5] it was found that antimicrobial residues are present in the Saudi poultry industry for example, birds are frequently raised in conditions where there is high level of stress and where different types of antibiotics are used. This might result in drug residues in meat of chicken [10], in Sudan a study showed that the consumer was at constant risk of exposure to antimicrobial residues in table eggs, [11] also detected risky antibiotic residues in meat samples. Antimicrobial residues may have a direct toxic effect on consumers, for example allergic reactions in hypersensitive individuals. It has become necessary, therefore, that regulations are in place to ensure that antimicrobial residues are not present in animal products for human consumption at levels that may affect human health detrimentally [12].

## 2. MATERIALS AND METHODS

### *Study area*

Al Taif is the third city of Saudi Arabia. It covers about 540 km<sup>2</sup>, of which 18.2 km<sup>2</sup> is rural. It lies between 2200 and 2500 m above sea level. In Al Taif, there is one municipal abattoir where cattle, sheep, goats and camels are slaughtered and animals for slaughter come from different regions of the western province in Saudi Arabia. The main purposes of the Al Taif abattoir are processing of one or several classes of livestock into fresh meat for



human consumption, hygienic processing and storage of meat and edible by-products [13].

#### Sampling method

The method employed to select the respondents was a simple random sampling method. Respondents were selected during questionnaire administration in different parts of the town and peasant associations around the town. During the questionnaire administration, any member of the households who was willing to participate in the interview was taken as a sampling unit.

#### Study methodology

A semi-structured questionnaire was pretested and used for the face-to-face interview to evaluate the perception of

the community about the presence of antimicrobial drug residues in our food. Arabic language was used for the interview. 25 min were spent with each respondent. Questions in the questionnaire contained questions that can evaluate the perception of the respondents about antibiotic agents, their use as human medication, importance, their use as growth promoters and medication for animals, their adverse effects on human health when present as residues in meat, milk and eggs.

#### Data management and analysis

The data collected was properly coded and entered into an excel spreadsheet, which was later on entered into SPSS version 17, which was used to analyze the results.

### 3. RESULTS

Table1: do you know that antimicrobial drugs can be transferred to humans through consuming animal products

Gender	Is the presence of these drugs harmful			Do you know that antimicrobial drugs can be transferred to humans through consuming animal products		
	No knowledge	Yes	No	No knowledge	Yes	No
Male	12	65	16	6	63	24
Female	0	7	0	0	7	0

Table2: Source of antimicrobial drugs.

Education	Which products contain more antimicrobial drug residues				Where do antimicrobial drug residues come from		
	No Knowledge	Chicken	Red meat	Eggs	No idea	Right answer	Wrong answer
Primary	0	4	4	0	0	8	0
Secondary	12	8	4	4	8	12	8
High	12	4	4	8	4	16	8
University	4	8	0	24	12	12	12
Total	28	24	12	36	24	48	28
$P < 0.05$							

Table3: Consequences of the presence of these drugs in food

Education	A	B	C	D	E	F	G	H	I	Total
Primary	0	0	3	0	0	3	0	0	0	6
Secondary	7	6	0	0	3	0	3	0	2	21
High school	7	6	5	0	0	3	5	4	0	30
University level	16	0	9	5	0	0	7	6	0	43

A: No knowledge, B: Toxicity, C: Tumors, D: Environmental pollution, E: C+B  
F: A+B, G: Diseases, H: Digestive disorders, I: Reduce immunity,  $P < 0.05$

### 4. DISCUSSION

In table 1 it is clear that a big proportion of the sample under study has no idea about the presence of antimicrobial drugs in, also they have no idea that these drugs have adverse effects on their health.

Table 2 shows that 52% of the sample tested don't know that these drugs come to our food from their misuse by farmers or their workers during the early stages of meat

products production, which indicates a real need to educate the public about antimicrobial drug residues origin. 30% of the samples have no idea about the consequences of the presence of these drugs in our food (table3).

When the samples were asked which products contain more antimicrobial drug residues the majority thought of poultry meat and egg, the majority of the samples had no idea about source of these drugs in food.



The use of antimicrobial agents in food-producing animals is a very important public health issue [14]. These drugs are used for the treatment of animals, disease prophylaxis also are used to improve productivity. However, many reports have indicated that microbial resistance to these agents, which can be transferred to human pathogens [19]. In addition it can also lead to immunological response in susceptible individuals and cause disorder of intestinal flora [15].

World Health Organizations (WHO) and Food and Agriculture Organizations (FAO) have set tolerance or Maximum residue limits (MRLs), acceptable daily intakes (ADIs) for humans and withholding times for pharmacologically active substances including antimicrobial agents prior to marketing [16].

It is advised to use antimicrobial agents interchangeably for treatment and control of diseases in farm animals. Because of poor farming system practiced by the small scale farmers, problems like antimicrobial resistance can appear, which necessitates farmers to frequently change antimicrobial agents.

## 5. CONCLUSION

Antimicrobial drugs are used both in humans and animals to cure and promote good health, also antibiotics employed for prophylactic purposes [17], the misuse of these chemicals can lead to serious health problems, consumers, farmers and their workers must be well educated and trained to achieve the best of these chemicals, withdrawal periods indicated by drug manufacturers must be strictly followed by animal producers. Some countries like Sweden banned the use of microbial growth promoters in food producing animals, which resulted in a huge decrease in the use of these chemicals up to 55% [18]. A control system must be applied to products that might be contaminated with these products, like poultry meat, red meat and eggs to assure that the concentration of these chemicals is within the accepted range that doesn't harm humans.

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