

The Effect of Some Factors on the Meat Production, Meat Information and Awareness Eating Red Meat Relating to Human Health in Sulaymaniah Province

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Abstract Background: knowledge eating meat in Sulaymaniah province is poorly assessed and there is a general lack of documented knowledge about the challenges facing this field and the needs for its development. In the last few years, economy of Iraqi Sulaymaniah city is dominated by oil industry, agriculture and tourism sectors calm in the Kurdistan region; it has massive economic development in comparison to the other Iraqi cities. Unfortunately, this case caused an increase in heart diseases for instance, high blood pressure, and high cholesterol level and so on in this region particularly in Sulaymaniah province according to some reports that have been published by Statistics Directorate of Health Sulaymaniah province from 2008 to 2012. **Methods:** In this research, people were randomly (sex, age, education level and lifestyle) chosen in Sulaymaniah province. All participants are having heart problem and high blood cholesterol Firstly, blood samples were tested for the participants, where the cholesterol type was LDL (low density lipoprotein), and participants who have higher LDL above normal the level 190 mg/dL where chosen for the present study. **Results:** The study revealed significant problems facing the information about meat production in Sulaymaniah province, knowledge eating meat, information about the advantageous and disadvantageous of red meat, daily red meat requirement, knowledge about the level of cholesterol in meat, do not sources that give you enough information about red meat and there is strong relationship between cholesterol and heart and blood problems. In addition, sex, educational level, age and life style were also showed significant different ($p < 0.05$) in the knowledge level about the red meat production, eating red meat behaviors, and the red meat nutrition relating to human health.

Keywords Red Meat, Eating Meat, Awareness and Human Health

1. Introduction

The domestication of animals and the development of animal husbandry ensured a more reliable source of meat and coincidentally reduced the number of species from which it was obtained to about two dozen or so, of which half are now significant sources of meat. These include not only mammals such as cattle, sheep, goats, pigs, buffaloes, camels, yaks, llamas, deer and rabbits but also birds, especially domestic fowls and turkeys, geese and ducks [32].

Red meat is an important source of high biological value protein as it contains the protein, Fat, Ash, carbohydrate and energy and important micronutrients those are needed for good health throughout life [11]. But Human must introduce meat health production because Contamination of animal carcasses and raw meat by microorganisms, including spoilage and pathogenic types, is practically unavoidable.

Sources of contamination of carcasses during the slaughtering process, of meat products during processing, storage and handling, or of water and other foods through contaminated manure [17, 18, 28, 29, 30 and 31].

Meat is an important source of animal protein and other nutritional components but cholesterol in meat is a potential cause of human diseases. Meat generally contains moderate quantities of cholesterol and the values typically range from 7 to 90 (mg/100 g) except in the case of some edible offal where the concentrations are much higher [3,24]

Cholesterol plays a variety of important roles in cellular function and a variety of significant roles in a biological system. Cholesterol is a eukaryotic sterol that, in higher animals, is the precursor of bile acids, vitamin D3 and steroid hormones [14].

Dietary cholesterol comes mainly from animal products such as eggs, seafood, meat of slaughter animals and milk [24].

Cholesterol LDL is closely related to dietary disorders [22], whereas the HDL cholesterol is known as .good. Cholesterol because it tends to carry bad cholesterol (LDL) away from the arteries and back to the liver, where it is

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removed from the body. High blood levels of cholesterol correlate with different cardiovascular diseases [23] such as atherosclerosis, coronary heart disease and hypertension [10]. The relationship between dietary diseases and the content of cholesterol is one of the main research problems in 21st century.

Economic and social factors affecting the consumption of food (meat), such as, catering place, individual economic level, the price of food, education, religion, social occasions, religious occasions, the distribution of food among family members, travel and tourism and media [34].

The knowledge of Sulaymaniah city's residential about red meat production process and the advantageous and disadvantageous of red meat were studied. Also, another important point was to inform consumers how to get proper nutrition education (Red meat) to have maximum benefits from meat to build a healthy body. And the message to all mass media and the Kurdistan government, as they are spread knowledge about local and imported red meat and the production process.

2. Materials and Methods

Participants:

In this research, people were randomly (sex, age, education level and lifestyle) chosen in Sulaymaniah province. All participants are having heart problem and high blood cholesterol, Blood samples were tested for the participants, where the cholesterol type was LDL (low density lipoprotein), which they were confirmed by the center of health and the main laboratory in emergency hospital-Sulaymaniah. And the below questionnaire form was filled by the participant who the LDL level was higher than the normal level 190 mg/dL.

Faculty of Agriculture

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Basic information:

- 1) Sex: Male (2) Female (1)
- 2) Educational level: Illiterate(1) Primary(2) high school(3) Diploma(4) Bachelor(5) Master(6).
- 3) Ages group: 10-20(5) 21-31(4) 32-42(3) 43-53(2) above 54 (1).
- 4) Sulaymaniah province Avenue ()
- 5) Life style: Very good (5) Good (4) Medium (3) poor (2) very poor (1).

Kindly tick the box that you will choose.

- 1) Do you have scientific knowledge about meat texture?
Very much (5) much (4) medium (3) little (2)
very little (1)
- 2) Do have information about the process of red meat production in Sulaymaniah?
Yes (3) Little (2) No (1)

3) Do you have enough information about advantages of red meat?

Yes (3) Little (2) No (1)

4) Do you have information about the disadvantageous of red meat?

Yes (3) Little (2) No (1)

5) Do you know how much daily red meat requirement (Animal proteins)?

Yes (3) Little (2) No (1)

6) Do you really need to know about the source of red meat when you have it?

Very much (5) much(4) medium (3) little (2)
very little (1)

7) When you buy red meat do you depend on;

Temptation (3) prize (2) imitation (1)

8) When you buy and eat red meat do you depend on:

Local meat (4) Imported meat (3) both (2)

9) Do you have knowledge about levels of cholesterol in meat?

Yes (3) Little (2) No (1)

10) Do you know there is a strong relationship between cholesterol and heart and blood problems?

Yes (3) Little (2) No (1)

11) Do you have sources that give you enough information about red meat?

Yes (3) Little (2) No (1)

12) The responsibility of giving information about daily meal and meat is belonging to

People (5) family (4) mass media (3)
educational centers (2) academic centers (1)

13) Frequency red meat eaten was

Meal (4) daily (3) weekly (2) monthly (1)

14) Is red meat the main part of your meals?

Yes (3) Little (2) No (1)

15) Do you account red meat as a main source of protein or instead of:

White meat (2) protein of the legume family (1)

16) According to your health record, do you think your sickness is related to:

Family history (4) food (3) I do not know (2)
other factors (1)

Statistical analysis:

The percentage of each factor and the influence of some factors on the questionnaire's result were found by using JMP7 program at significant level ($p < 0.05$). In addition, Duncan test was used to find the significance between factors.

3. Results and Discussion

Blood tests were conducted for the participants, the cholesterol types were LDL and above normal level 190 mg/dL [21].

In this research (Basic information), 39.5% and 60.5% of the participants were male and female, respectively. Also, 3.5%, 14.5%, 26.5% and 55.5% of the participants were

(31-21), (42-32), (53-43) and above 54 year in ages, respectively. In terms of educational attainment (non-educated people, primary degree, high school degree, Diploma, bachelor and master), 51% of participants were having non-educated, 30.5% were having primary degree, 9% were having high school degree, 4.5% of participants were having Diploma, 4.5% were having bachelor degree and 0.5% having master degree. Different cost of living was shown in this investigation. 1.5% of participants were very poor, 8.5% were poor, 49.5% were mild, 38.5% were good and 2% were very good.

The majority of participants were above 54 years and having high level of cholesterol. [34] Showed that food was not equally dividing among family. The children should have food more than others as they need to grow. Educational attainment was affected on increasing cholesterol level in the blood. Educational attainment has a direct relationship with food eating policy among family, reported by [34]. Also, [1] demonstrated that age, gender and educational attainment, have an effect on food eating policy. It can be seen easily from our results that the cost of living was affected on high level of cholesterol. Our studies corroborate with [34] that economic problems such as food price, cost of living affect quality and quantity of foods that were consumed by human.

The effects of sex (male and female) on red meat productions meat and eating have been shown in table 1. Results showed that sex affected on red meat production in Sulaymaniah. Also, it affected on advantageous and disadvantageous of red meat on human health and cholesterol level in meat at a level ($p < 0.05$). In contrast, gender did not affected on human daily need for red meat. It found all participants were having little information about the production of red meat in Sulaymaniah, the beneficial and deleterious of red meat on human health. These results are in confirmation with the results reported the age and sex more impact on dietary behaviors and food eating (meat) and affect the Improve the quality of nutrition and food awareness programs.

The amount of meat eaten also varies between different population subgroups, For example, show that men tend to consume more red meat than women: on average, men aged 19-64 years ate 96g of red meat per day compared with intakes of 57g per day in women of the same age [2]. Similar trends are observed in teenagers aged 11-18 years, with around 75g and 54g of red meat being eaten daily by males and females, respectively. For children aged 4-10 years, daily intake of red meat is around 47g for both sexes [2].

Lean red meat is rich in protein of a high biological value, and represents a good source of B vitamins, iron, zinc and selenium [19]. Veal is low in fat and, along with pork, is low in saturated fat according to European Union [9] regulations. Although red meat contains some saturated fats, the predominant type is stearic acid, which has not been found to increase serum cholesterol levels [6]. Stearic acid also appears to have no effect on other metabolic factors that may influence cardiovascular disease risk, such as plasma glucose and insulin [13].

Table 2 presented the effect of educational attainment (non-educated people, primary, high school, diploma, bachelor and master) on red meat production, dietary behaviors (meat) and effects on human health. It is clear from the table 2 that educational attainment was significantly affect ($p < 0.05$) on red meat eating education. The participants having bachelor degrees were aware of on advantageous and disadvantageous of red meat on human health, cholesterol level in meat and the process of red meat production in Sulaymaniah. Generally, the majority of the participants believed that mass Medias' should take responsibility to publish more information about read meat through TV programmes, work-shops, reports in the newspapers and leaflets. This result degree with [19], Media articles about meat and health can be confusing for patients, particularly when they claim that eating red meat is detrimental to health as occurred following an earlier [33] report .

The average contribution of meat to total fat intakes has declined considerably over the past few decades because of changes in farming and breeding practices, such as selecting breeding livestock with genetic potential for lean growth and lower fat deposition, developing feeds that promote lean growth as opposed to simple weight gain, and skilled selection of livestock for slaughter at the right stage in their growth. Improvements in butchery have allowed intramuscular fat to be almost entirely removed. The result has been a significant reduction in the fat content of meat by 30% for pork, 15% for beef and 10% for lamb [12].

The relations of meat intake with major health outcomes, and on which key nutrients this relationship depends, is essential for guiding consumer choices, setting and prioritizing dietary guidelines, and informing food reformulations to reduce risks [25].

Red meat is a source of fat-soluble vitamins including vitamin A, which is essential for the normal functioning of the eyes and immune system [4] Red meat is also one of the few foods that contain vitamin D in the form that is best used [5]. With regard to micronutrients, lean red meat contains a range of essential vitamins and minerals that are important for all life stages [35]. Red meat also contains substantial amounts of vitamin B₁₂ which is known to benefit older people and patients with intestinal diseases [15], and the benefits of meat protein are to build the cells of the body and the composition of some important hormones such as the thyroxin hormone, insulin hormone and adrenaline hormone. But Meat is a major source of protein and fat in most diets. Substantial evidence from epidemiological Studies shows that consumption of meat, particularly red meat, is associated with increased risks of diabetes, cardiovascular disease (CVD), and certain cancers. Several studies also suggest an elevated risk of mortality associated with red meat intake. However, most of these studies have been performed in populations with a particularly high proportion of vegetarians [20]. Cardiovascular disease (CVD) refers to a range of medical conditions that affect the heart and vascular system, for example coronary heart disease, stroke and

myocardial infarction. Prospective observational studies have linked high meat intakes with an increased risk of CVD [35].

Table 3 presented the influence of cost of living on the information of red meat, production of red meat and the effect of red meat on human health were demonstrated. It is apparent from this table that cost of living was affected on the process of red meat production in Sulaymaniah, daily need red meat and cholesterol level in red meat ($p < 0.05$). The living cost for a family also affects food consumption, and therefore in the nutritional status of the members of the community.

High consumers of red and processed meats should consider reducing intakes to 500g per week, was interpreted wrongly by some media as an indication that meat consumption was harmful. The best advice for patients is to eat red meat as part of a balanced diet in amounts that fall within the new recommended ranges: no more than 500g per week, or 70g per day [26].

These guidelines can be achieved easily by monitoring portion sizes and eating processed meats less often. A 70g

portion of meat, for example, includes one lamb chop, two slices of roast lamb, beef or pork, and two standard beef burgers, three slices of ham or six pieces of salami sausage [7].

The effect of age on meat production and the construction of red meat eating on human health were shown in table 4. It revealed that age was affected on the percentage of information about red meat, and production process in Sulaymaniah ($p < 0.05$). The interesting thing that the participants were ranging between (32-42) in age has enough knowledge about advantageous and disadvantageous of red meat and related human health. The age more effect on dietary behaviours and food eating and affect the Improve the quality of nutrition and food awareness programs. Cholesterol in meat is a potential cause of human diseases and little is known about the cholesterol content in muscles. It should be emphasized that the amount of cholesterol in meat can vary extensively, depending on many factors such as age, sex, the animal species, the diet of the animal and the particular cut of meat [16].

Table 1. The effect of sex on the meat production, meat information, eating red meat relating to human health in Sulaymaniah province

Questions \ Gender	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Male	1.6 a	1.7 a	2.1 a	2.3 a	1.1 a	3.8 a	2.9 a	3.8 a	1.1 a	2.5 a	2.1 a	3.2 b	2.0 a	2.0 a	1.9 a	2.3 a
Female	1.1 b	1.2 b	1.6 b	1.7 b	1.0 a	3.7 a	2.9 a	3.8 a	1.0 b	1.8 b	1.8 a	3.5 a	1.9 b	1.8 b	1.9 a	2.4 a
Level of significant	*	*	*	*	N.S.	N.S.	N.S.	N.S.	*	*	*	*	*	*	N.S.	N.S.

Means having different letters in the same column are significantly different within same types
The differences at $p < 0.05$.
N.S.: non-significant. *: significant.

Table 2. The effect of Educational level on the meat production, meat information, eating red meat relating to human health in Sulaymaniah province

Questions \ Educational level	Illiterate	Primary	high school	Diploma	Bachelor	Master	Level of significant
1	1.039 c	1.210 c	2.056 b	2.000 bc	3.667 a	2.000 bc	*
2	1.118 c	1.565 c	2.056 b	1.875 bc	2.556 a	2.000 bc	*
3	1.490 c	2.016 b	2.444 a	2.875 a	3.000 a	2.000 bc	*
4	1.637 b	2.081 b	2.500 b	2.875 b	3.000 a	3.000 a	*
5	1.000 b	1.048 b	1.389 a	1.125 b	1.556 a	1.000 b	*
6	3.578 a	4.000 a	4.111 a	4.125 a	4.000 a	4.000 a	N.S.
7	2.931 a	2.952 a	3.000 a	3.000 a	3.000 a	3.000 a	N.S.
8	3.892 a	3.855 a	3.833 a	4.000 a	4.000 a	2.000 b	*
9	1.029 c	1.097 bc	1.278 ab	1.000 c	1.556 a	1.000 c	*
10	1.480 a	2.565 a	2.500 a	2.750 a	3.000 a	3.000 a	N.S.
11	1.667 c	2.161 b	2.444 ab	2.500 ab	2.889 a	2.000 bc	*
12	3.559 a	3.258 a	3.167 a	3.000 a	3.111 a	4.000 a	N.S.
13	1.873 b	2.016 b	1.889 b	2.125 ab	2.556 a	2.000 b	*
14	1.480 c	1.661 b	1.778 ab	1.500 b	2.333 a	2.000 ab	*
15	1.912 a	1.935 a	2.000 a	2.000 a	1.889 a	2.000 a	N.S.
16	2.294 a	2.581 a	2.389 a	2.625 a	2.556 a	1.000 a	N.S.

Means having different letters in the same row are significantly different within same types
differences at $p < 0.05$.
N.S.: non-significant. *: significant

Table 3. The effect of Life style I on the meat production, meat information, eating red meat relating to human health in Sulaymaniah province

Life style Questions	Very good	Good	Medium	poor	very poor	Level of significant
1	2.750 a	1.416 b	1.293 b	1.059 b	1.000 b	*
2	2.250 a	1.584 a	1.374 b	1.059 b	1.000 b	*
3	2.000 a	1.588 a	1.980 a	1.805 a	1.000 a	N.S.
4	2.500 a	1.857 a	2.111 a	1.706 a	1.000 a	N.S.
5	1.500 a	1.117 b	1.051 b	1.000 b	1.000 b	*
6	4.250	3.883	3.818	3.412	2.667	N.S.
7	3.000	2.974	2.929	2.941	3.000	N.S.
8	4.000	3.896	3.848	3.882	4.000	N.S.
9	1.750a	1.104b	1.010b	1.412a	1.000b	*
10	2.750	1.766	1.929	2.000	1.667	N.S.
11	2.750a	1.883ab	2.051ab	2.000ab	1.000b	*
12	3.000	3.325	3.465	3.412	3.000	N.S.
13	2.250	1.974	1.909	2.059	2.333	N.S.
14	2.000	1.610	1.586	1.529	2.000	N.S.
15	1.750	1.948	1.919	1.941	2.000	N.S.
16	2.750	2.286	2.475	2.529	2.333	N.S.

Means having different letters in the same row are significantly different within same types
The differences at $p < 0.05$.
N.S.: non-significant. *: significant

Table 4. The effect of age on the meat production, meat information, eating red meat relating to human health in Sulaymaniah province

Ages group, years Questions	21-31	42-52	43-53	Above 54	Level of significant
1	1.571ab	1.690a	1.585a	1.126b	*
2	1.571ab	1.655a	1.717a	1.243b	*
3	2.000ab	2.172a	2.170a	1.631b	*
4	2.000ab	2.310a	2.264a	1.739b	*
5	1.143ab	1.172a	1.132ab	1.027b	*
6	3.571b	4.172a	4.057a	3.595b	*
7	3.000	2.966	2.943	2.946	N.S.
8	3.714	3.931	3.849	3.883	N.S.
9	1.000b	1.138ab	1.189a	1.045b	*
10	1.714	2.276	2.302	1.865	N.S.
11	2.000ab	2.276a	2.226a	1.784b	*
12	3.143ab	3.103b	3.415a	3.468a	*
13	1.857b	2.276a	1.868b	1.928b	*
14	1.286b	1.966a	1.604ab	1.532b	*
15	2.000	1.966	1.962	1.901	N.S.
16	2.429ab	2.655a	2.547ab	2.279b	*

Means having different letters in the same row are significantly different within same types
The differences at $p < 0.05$.
N.S.: non-significant. *: significant.

A considerable number of studies have reported different quantities of cholesterol content in the muscles of different species. Most meats contain moderate quantities of cholesterol and values generally range from 70 to 90 (mg/100 g), except for the cases of some edible offal such as kidney, heart and brains, where the concentrations are much higher [3 and 24]. And [8] indicate that cholesterol content in beef meat remains at a level of 58.3-83.4 (mg/100 g) of tissue. For instance, lamb has been reported to contain 63-75.4 (mg/100 g) (15), veal – 70 (mg/100 g) and pork 70-205

(mg/100 g) [3].

4. Conclusions

The majority of voluntaries had little knowledge about the mechanism of red meat production, advantageous and disadvantageous viewpoints of red meat in Sulaymaniah. Also, they believed the mass media should have massive role to educate people about this issue. Both, gender and educational levels have effects on knowledge about red meat,

especially bachelor degrees. Economic condition has a little effect on red meat production and the red meat eating education. Although, ages have an effective effect on this issue, particularly these voluntaries were between 32-42 years. According to some health reports most of the voluntaries that have high cholesterol level related to food policy and animal sources. These show that multi-directional aspects and strategies such as extension programs and interior media must be activated and followed by the government and hence the study of the role of knowledge in the lowering the rate of these cases.

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