

# The Study and Measured Oil and Cholesterol Iranian Beef from Stirps Sistani with 4 Different Solvents and 2 Different Methods

Hessam Khodabandehlo<sup>1\*</sup> and Zahra Piravi Vanak<sup>2</sup>

<sup>1</sup>Department of Chemical Engineering, Shahrood Branch, Islamic Azad University, Shahrood, Iran

<sup>2</sup>Faculty Member the Scientific Research Institute of Food and Agricultural Standards, Karaj, Iran

## Abstract

The purpose of this experimentation and study, fine the amount of oil and cholesterol in Iranian beef that people and customers used it. During the experimentation we used 4 different solvent (chloroform, diethyl ether, petroleum ether and hexan) and with two different method (hot and cold method). In first step, we extracted oil and next level measured cholesterol. The method of warm the soxhlet with contiguity time 6 hours, and the method of cold (soak) with contiguity time 24 hours. Meat samples dried in freeze-dryer and Oil extracted and then cholesterol samples measured in the GC. The highest oil extraction rate is for chloroform with 2.89% and in cold method. The maximum rate of cholesterol measured for petroleum ether sample in cold method that was 99.07%. With regard to the amount of oil and cholesterol measured, Iranian beef from the stirps of Sistani are not suitable food for heart health and arteries.

**Keywords:** Petroleum ether; Diethyl ether; Hexan; Chloroform; Oil; Cholesterol; Soxhlet

## Introduction

Meat consumption has increased since World War II. While this increase has long been confined to the Western world, that is, North America, North and Western Europe, and Australia/New Zealand, meat consumption is now also on the rise in other countries, such as China, due to their economic development [1]. From a physiological perspective, a diet rich in meat has several potential nutritional benefits but also some potential adverse effects. Meat is rich in protein, iron, zinc and B-vitamins, as well as vitamin A. The bioavailability of iron and folate from meat is higher than from plant products such as grains and leafy green vegetables. The drawback, however, is the high content of cholesterol and saturated fatty acids, both of which have been shown to be positively associated with plasma low density lipoprotein (LDL) concentrations and the risk of coronary heart disease [2]. Although iron is essential for prevention of anemia, a high intake, especially of heme iron, is related to the endogenous formation of N-nitroso compounds in the gastro-intestinal tract [3,4] and, thus, may be a risk factor for some cancer entities, for example, colon cancer [5]. Some prospective studies have evaluated the association between meat intake and mortality [6,7] but several of them were studies comparing meat consumers with vegetarians. One of the most recent studies, conducted among EPIC-Oxford participants, revealed that vegetarians as well as non-vegetarians with a health conscious lifestyle had a statistically significantly lower mortality compared with the British general population. This is similar to the results of a German cohort, in which both vegetarians and health-conscious non vegetarians had a statistically significantly lower overall mortality compared with the general population [8-10]. In the UK and Ireland, men and women's average daily intakes of total meat are 108 g and 72 g and 168 g and 107 g, respectively [11,12]. Total meat can be broken down into red meat (including beef, lamb, veal and pork), white meat (including chicken, game and turkey) and processed meat (including cured and smoked meats; ham, bacon, sausages, hamburgers, salami and tinned meat). For the purpose of this paper, the mention of red meat from here on will refer only to red meat which is unprocessed. Data from the North South Ireland Food Consumption Survey (NSIFCS) show that red meat is consumed by 88% of the Irish population, who have slightly higher intakes of beef (39.1 g/d) than of lamb (22.8 g/d) [13].

## Materials and Methods

### Materials

Beef prepared from market Iran and strips native cows (stirps Sistani) and solvents includes hexan, petroleum ether, chloroform and diethyl ether bought from Merck Germany company. To study the amount of oil extracted from the rotary evaporation and to study the amount of cholesterol was used G.C (Yang leane 6500 model) with column length 30 meters.

### Methods

Samples of beef prepared from market, after cleansing of meat from fat and streaks of non-meat in wheel meat, mixed meat, and then was dried in the freeze-dryer until moisture achieved to 8-10%. The dried samples packing in 10 grs packed and experimented in soxhlet method and some other samples for extraction in cold extraction of the afloat (24 hours in dark environment). In the continuation of the examination process and oil extraction, separation of oil from solvents and oil texture, dilution of extraction input in the rotary evaporation under vacuum with temperature 40-60°C for extract of solvent from oil that was extract in first level we weighted oil that was extracted and second level was measured cholesterol. (Based on 6081 standard and 16324 standard of Iran).

**Note: for comparison of data, we used completely randomized design in minitab 16 and with 3 repeat.**

## Results

Figure 1 shows the highest percentage oil extracted with petroleum

**\*Corresponding author:** Hessam Khodabandehlo, Department of Chemical Engineering, Shahrood Branch, Islamic Azad University, Shahrood, Iran, E-mail: [hessamkhodabandehlo@yahoo.com](mailto:hessamkhodabandehlo@yahoo.com)

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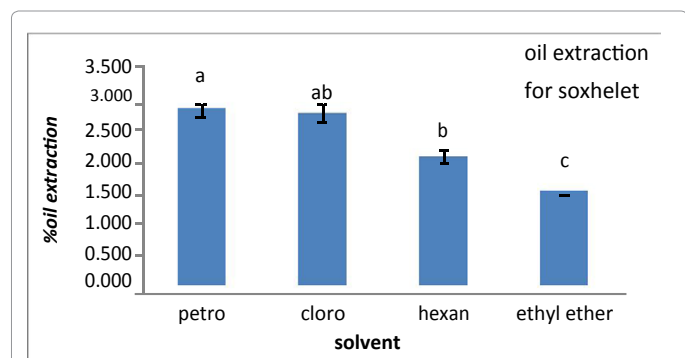
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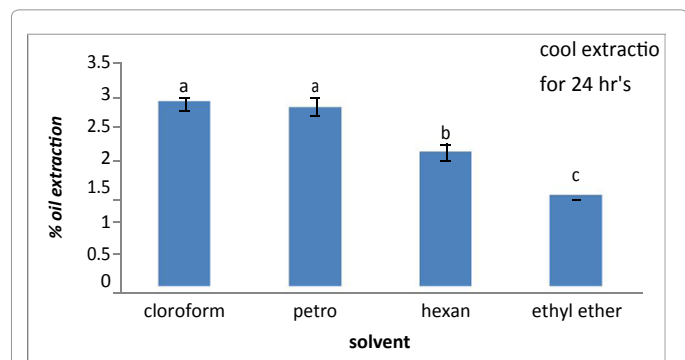
ether and is the least related to sample diethyl ether. Figure 1 shows the greatest amount of oil is extracted with petroleum ether and chloroform and the least amount for diethyl ether. In the tests that the information in it was shown up as an example of the cold with three repeat for 24 hours under mining and accruing information are as follows.

The Figure 2 shows the greatest amount of oil in cold method for chloroform and the least amount of diethyl ether.

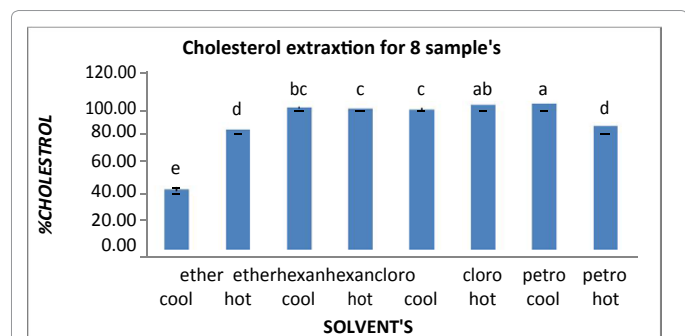
As in Figure 3, the highest amount of cholesterol extraction related to petroleum ether extraction method with cold and chloroform with hot method. Also the least amount of cholesterol rate related to diethyl ether



**Figure 1:** Oil extraction with 4 solvent in soxhlet method. The difference between letters up represents there are signification between samples ( $p > 0.05$ ).



**Figure 2:** Oil extraction with cold method for 24 hours. The difference between letters up represents there are signification between samples ( $p > 0.05$ ).



**Figure 3:** The amount of cholesterol in the sample Determination of Cholesterol in 8 samples oil: The difference between letters up represents there are signification between samples ( $p > 0.05$ ).

ether in cold method. It should be noted that the important point for 2 solvent are better polarity than other solvents and other factor is time of the contiguity between solvent and meat samples.

## Conclusions

1. The highest amount of oil extracted in warm method (soxhlet) related to sample extracted with petroleum ether, the average oil obtained to 2.832% of the total sample weight.
2. The highest amount of oil extracted in cold method for 24 hours soak by chloroform, this amount included 2.891% of the total sample weight.
3. The greatest amount of cholesterol extracted in cold method is with solvent of petroleum ether, this amount of mining in average to 99.07%. Also the difference with meaningful method of warms this solvent.
4. The least amount of cholesterol was related to cold method and with diethyl ether. 41.16% of the total cholesterol was extracted.
5. The temperature in the cholesterol extraction between samples, has most effect on diethyl ether, because in cold method rate of extraction is near 50% of hot extraction.

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