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Assessing the Health Benefits, Challenges and Protection Techniques of Eating Rabbit Meat production

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Abstract

The health of the rural finances, equitable growth and rabbit meat can benefit from rabbit consumption. Low fat, high amount of unsaturated fatty acids, High proteins, low cholesterol levels and low salt are few of the many positive nutritional features of rabbit meat. Further supporting economic activity in rural outlying regions is the manufacture of rabbit meat. Nonetheless, there are few people who consume rabbit meat because of a number of issues, including the increased price of commercial feed that is delaying the mating of rabbits. Consumers' opinions, socioeconomic background and country affect the need for and intake of rabbit meat. Convenience-focused goods made from rabbit meat are becoming more popular as a result of recent socioeconomic shifts. Customers are becoming more aware of methods used to raise animals due to ethical as well as medical concerns. This essay provides a general review of rabbit meat with an emphasis on marketing, customer preferences, nutritional makeup and production. In addition to information efforts, the research suggests tactics that might increase consumer awareness of the benefits of rabbit meat and support the growth of the industry.

Keywords: Nutrition, Rabbit Meat, Consumer's Attitudes, Marketing, Consumers Preferences, Rabbit Farming.

INTRODUCTION

The concept of meat quality is in a state of continual development. Consumers these days are concerned with pricing, convenience, quickness of preparation and meat quality. There has been a lot of interest in rabbit production since rabbit meat is one of the most popular and healthy foods due to its many benefits (1). The creation of functional foods a novel strategy for achieving a healthier state that lowers the risk of disease has resulted from growing understanding of the nutritional value and healthfulness of meat. Since they have short reproductive periods, prolific output and excellent feed yields, rabbits are an ideal species that are raised across the world for the manufacturing of meat (2). Furthermore, Egypt and many other European countries are big consumers of rabbit meat. Nonetheless, another significant factor impeding the rabbit meat sector is a lack of knowledge about the nutritional value and processing techniques. Meat from any sort, including rabbit, can have implications for public health. As a result, microbiological contamination will result from any handling error. There are many different types of bacteria that can infect raw meat, some of which can cause zoonotic illnesses (3). The bacteria and viruses that were discovered in rabbit meat were yeast and mold, microorganisms that are aerobic and microorganisms. Utilizing contemporary meat preserving technology, several research have been carried out to lower microbial infection; in particular, natural antibacterial and antioxidant compounds such chitosan (CH) and rosemary essential oil (REO) (4). The study provided an overview of the research on the health advantages and quality of rabbit meat and to draw attention to any potential health issues associated with the existence of this digestive virus. Additionally, this research provides advice for improving the quality and retention period of rabbit meat based on several disinfection investigations carried out in Egypt and worldwide (5). Although meat and its derivatives can be considered as useful foods, they include unhealthy nutrients that are linked to overweight, diabetes, hypertension and cardiovascular disease (6). It is possible to decrease these vitamins and minerals by feeding, controlling productive variables, altering the post-mortem corpse and carefully choosing the portion of meat ingested (7). The study is to give an outline of earlier research on rabbit

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meat, with an emphasis on marketing, nutritional characteristics, consumer preferences and production. The examination of important aspects of rabbit farming and expenditure can have practical ramifications for farmers, marketers, business and legislators (8). These can serve as the foundation for the adoption of tactics meant to advance the rabbit meat sector.

The study (9) was to delineate the competitiveness-determining elements by describing as well as analyzing the state of play and interrelationships in the rabbit meat production chain. There was a mix in the investigation's methods. "Snowball" sampling was the method it employed. The study (10) soughed to create new sausages with rabbit as the only ingredient. To encourage more people to eat rabbits, a novel product was proposed. Another variant was developed with less fat to satisfy the needs of consumers. The study (11) looked at the way systems that produce affected the aging process of pale, soft and exudative (PSE-like) rabbit flesh. Premortem rabbit Longissimus thoracis lumborum were incubated at 37 °C for three hours to produce PSE-like meat. The study (12) determined the production of rabbit meat can benefit Ukraine's food security and contribute to the country's economy. Compared to red meat from sheep or cattle, rabbit meat is less harmful to the environment, more inexpensive and higher in nutrients. The study (13) examined the property of five dissimilar method of cooking on the topographical shifts fatty acid background, physicochemical properties, fat oxidation, sensory aspect of rabbit meat and microbiological quality. The techniques included boiling, oven-frying, cooking pan-frying and cooking in the microwave. The elements of Zanthoxylum bungeanum Maxim essential oil (ZBMEO) were examined in this study. It was determined the way various ZBMEO dosages affected the physical and chemical markers of the rabbit carcass patty (14). The study (15) predicated on the idea that adding thyme to rabbit eat at a particular amount will enhance the meat's health benefits and open up new avenues for the creation of safe products with high levels of antioxidants, retained nutrient content and ease of digestion. The study (16) looked at how temperature affected the way that the oxidation of proteins and lipids behaved in the meat of rabbits. It looked at the quality parameters of rabbit carcass at various temperatures when stored. The practical applications of several rabbit carcass anatomical locations are discussed. The worldwide situation of rabbit breeding at the moment is taken into consideration. The information provided includes the tissue composition of the various anatomical areas found in rabbit corpses (17). The study (18) assessed the impact of adding cookie trash on the productive parameters, carcass condition and rabbit meat quality during the present study. There were two treatments the normal or the clinical one using eight Nueva Zelanda rabbits that were assigned at chance. The research (19) ascertained the impact of varying dietary quantities of silkworm pupae meal (SWPM) on the growth characteristics and the molecular makeup of chick rabbits. The study (20) soughed to determine if Sida hermaphrodite meal could replace alfalfa meal in rabbit diets.

Rabbit meat production

Growing rabbits is uncomplicated and environmentally friendly in farm and backyard settings. There are notable differences in rabbit production among countries. In 2020, the majority of state rabbit meat production, amounting to 70.5 percent, was attributed to Tamil Nadu, with Maharashtra following closely behind, as indicated in Table (1). Rabbit meat production exhibited varying levels of quality across different Indian states, with Gujarat showcasing high production standards and Kerala registering comparatively lower production. Notably, Gujarat stood out for its elevated production quality, while Kerala experienced a more subdued output in the realm of rabbit meat.

Table (1). The total digit of rabbits raised and the amount of meat produced
(Source: Author)

State	**Production Quality (Tonnes)**		**Heads (1000)**	
	2010	**2020**	**2010**	**2020**
Gujarat	85,447	60,726	70,841	82,188
Delhi	8,638	7,122	12,170	10,387
Kerala	7,550	5,429	6,672	2,904
Tamil Nadu	28,586	34,025	40,261	15,248
Maharashtra	60,673	53,150	59,738	49,650

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High quantities of protein, low cholesterol, little fat, a high proportion of monounsaturated fatty acids and little salt are present in rabbit flesh. The caloric figures for rabbit meat are comparatively higher (603 kJ/100 g in the loin and 899 kJ/100 g in the forelegs) and they are equal to the thermal value of several common red meat kinds. This is since 80% of the nutritional value in an individual's diet comes from their high protein content. Consequently, it is strongly advised that elderly individuals, teenagers and pregnant women consume rabbit meat. Table (2) displays the work of nutrients of the two main components of rabbit meat.

Table (2). Composition of nutrients in various sections of rabbit meat
(Source: Author)

Compound	Hind Part	Fore Part
Moisture (weight %)	74.9-80.4	70.7-80.2
Carbohydrate (weight %)	0.2-0.7	0.2-0.7
Cholesterol (mg/100 g)	26.1-121.4	25.3-104.5
HDL (mg/100 g)	6.6-36.8	6.9-33.8
MUFA (mg/100 g)	27.2-32.3	26.8-32.9
Protein (weight %)	19.3-23.2	17.6-22.9
Fat (weight %)	0.6-4.8	0.9-9.9
Gross energy (Kcal/100 g)	86.9-119.9	87.4-162.4
LDL (mg/100 g)	4.7-79.5	6.9-27.6
SFA (mg/100 g)	36.8-43.5	33.6-42.8
EPA (mg/100 g)	0.1-0.2	0.2-2.2

The study is to offer a summary of earlier research on rabbit meat, with an emphasis on marketing, customer tastes, nutritional characteristics and production. For the purpose of implementing strategies targeted at developing the rabbit meat business, farmers, industry, marketers and policymakers can benefit from the examination of essential factors connected to rabbit cultivation and consuming.

Influencing Elements on the excellence of Rabbit Meat

The meat from rabbits is of a constant quality. Despite that is selected for delayed development, rabbits have a higher muscle-to-bone ratio and a better-shaped carcass. Rapidly growing animals have higher fat concentrations and greater lipolytic activity in the flesh of their back legs, although genetic composition had no effect on oxidative indices or liberated fatty acids. Thus, weaning the doe at the end of September would enable her to be ready for mating at an earlier time, thereby increasing the rate of reproduction. At one month of age for slaughter, both growth rate and feed efficiency decreased. It seems that the most economical way to produce rabbit meat is to remove the animal at thirty days of age and slaughter it at a year of age. The ultimate meat and carcass quality can be influenced by the housing and welfare conditions for rabbits. A number of variables, including housing, genetics, feeding, diet, managing reproduction, bio security and environmental circumstances, can be linked to the dangers. The feed's freshness has been demonstrated to be a major production-limiting factor in several rabbit housing setups. People perceive farms to offer a limited selection of food. Seasonality, a lack of a nutrition approach plan, inadequate education for farmers and low motivation are a few of the factors. Table (3) little rabbits weigh between 1.4 and 2 kg as adults, moderate kinds between 4 and 5.4 kg as well as large breeds between 6.4 and 7.3 kg.

Table (3). The excellence of rabbit meat and carcass is influenced by key factor
(Source: Author)

Housing System	Health-Related	Rabbit Type	Behaviour Related
Structurally enriched cages	Injuries	Old	Fear
Elevated pens	Reproductive disorders	Substantial in dimensions	Limited area
Outside system	Warm pressure		
Conventional cages	Hunger/Thirst	Young	Resting
Floor pens	Skin lesions	Compact in stature	Limitation of mobility

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Marketing and Supply Chain for Rabbit Meat

Significant organizational and logistical adjustments have been made to the rabbit supply chain. Before the business revolution, farmers would sell their rabbits for slaughtering or send them right away to the marketplace. A variety of metrics are employed to ascertain an item's marketplace worth. One of these is the commodities bazaar divide, which is the proportion of money or physical unit that it controls in the industry. The cost of processed food, which is twice the price of broiler chickens and 20–30% more than that of pigs, is the main obstacle to producing rabbits in a reasonable manner. This is partially because feed stuffs are made of foods like corn, soy meal, dried oats and other foods. Soy flour and dehydrated grass usually account for 10 to 20% and 30 to 40% of a rabbit's daily feed consumption, correspondingly.

The preference and demand of consumers for rabbit meat

Changes in demography, dietary preferences, financial status as well as customer concerns about animal abuse, health coupled with the surroundings are having an effect on how much and what kind of meat is produced. The two main movers among them are population increase and income. There is a movement toward more expensive sources of protein due to money availability. Forecasts indicate an increase of 11% in population by 2030, which will lead to a 14% rise in the consumption of meat. The appetite and frequency of consuming the meat of rabbits are influenced by a number of factors, including nationality and sociodemographic traits. Men are more likely than women to eat rabbit meat, according to previous studies. Intake of meat from rabbits was shown to be greater among older and wealthier customers.

Consumers' Attitudes towards Rabbit Meat Consumption

Price estimates have a big impact on opinions about buying. Consumers have differing perspectives on the price of rabbit meat. Certain individuals believe that rabbit meat is more expensive compared to various meats. In terms of healthfulness, some customers feel that rabbit meat offers better value than other meats. There is no way to cut the price for rabbit flesh without cutting the profit margin on high manufacturing expenses. Therefore, informational efforts on the health advantages of eating rabbit meat must be carried out to influence pricing perceptions. A schematic depiction of the ideas found in the literature that influence consumers' views toward the eating of rabbit meat is presented in Figure (1).

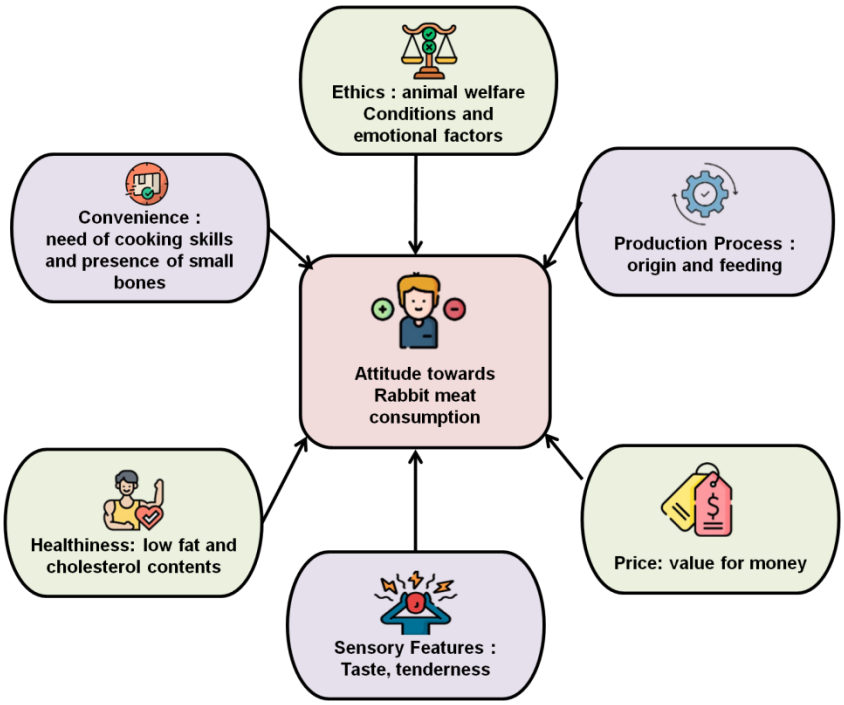

Figure (1). Attitudes toward consuming rabbit meat are influenced by the beliefs held by consumers (Source: Author)

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Consumers of Rabbit Meat Segmentation

Markets for rabbit meat have been divided according to socioeconomic status and demographic attributes such age, gender, education and standard of life. But values and lifestyles psychographic factors have shown to be more useful in classifying consumers. This result was noted in research regarding specific markets for rabbit meat. Food-connected behaviours are a collection of associations between actions along with values that are based on patterns, networks and cognitive categories. Lifestyles comprise objective methods that consumers utilize to get, consume, or refuse food, along with subjective impressions generated from product knowledge and interactions with customers that impact customer values. Thus, lifestyles encompass more than individual actions; they dive into the thought process that drives consumer behavior. The food-related lifestyle (FRL) model, which sheds light on the factors influencing buyers' value perceptions, is useful for identifying client categories with consistent tastes in meat from rabbits.

Benefits of consuming rabbit meat

Since rabbit meat is completely white, removing the fat is simple since, unlike deer, rabbit fat is external to the flesh rather than infused into it. We engage in the complete process of raising, slaughtering and preparing rabbits for consumption at our farm and processor facility, Thomas Road Processor, located in Sutherlin, Oregon. There are several nutritional advantages to rabbit meat that improve general health (Figure (2)).

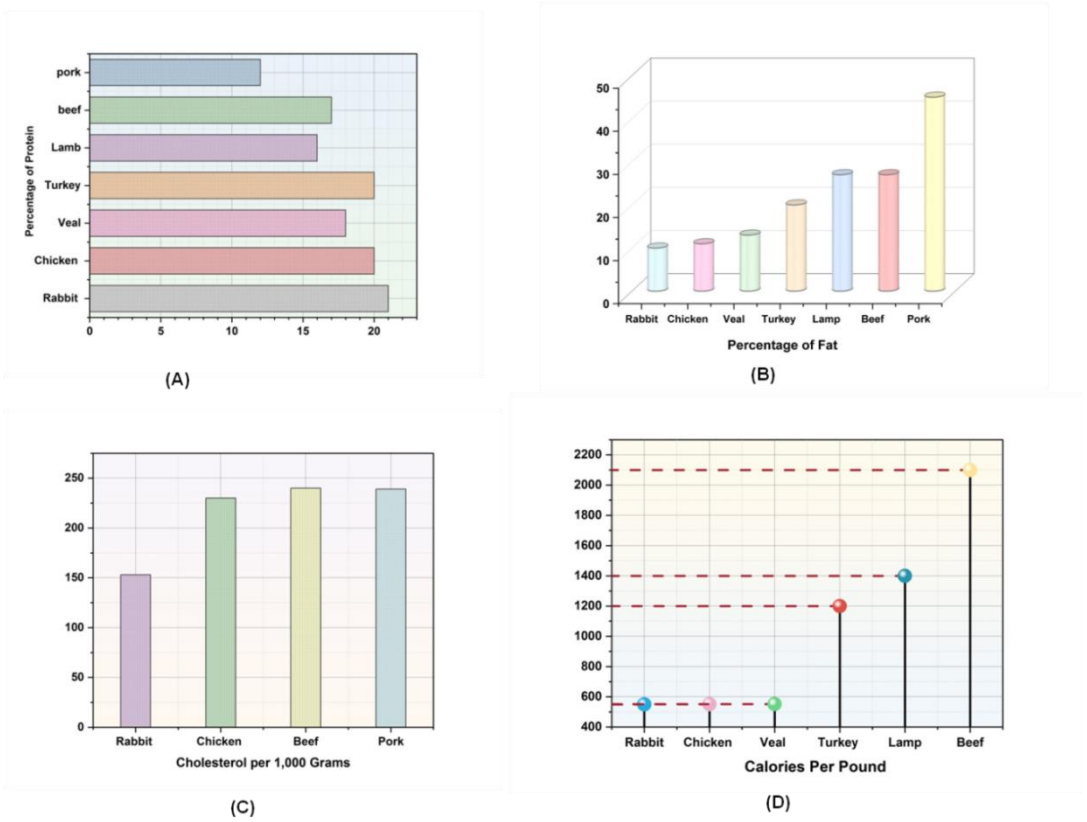

Figure (2). Benefits of consuming rabbit meat (a) Protein percentage (b) Cholesterol content for every 1000 grams (c) Fat percentage (d) Pound-to-calorie ratio

(Source: http://www.wagonhoffermeats.com/rabbit-facts.html)

Incorporating rabbit into diet provides a significant dose of vitamin B-12, crucial for the proper functioning of the central nervous system. Additionally, it is rich in vitamin B-3, aiding in the conversion of carbohydrates into energy. The meat contains phosphorus, essential for carbohydrate along with fat processing, cell and tissue repair, as well as optimal bone metabolism. Rabbit meat meets the recommended daily value of selenium, a mineral vital for antioxidant production, stimulation of sperm production, potential benefits in preventing

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arterial hardening and certain cancers, such as those affecting the stomach, lungs, prostate and skin. Explore the graph below for further insights into the nutritional composition of rabbit meat (Figure (3)).

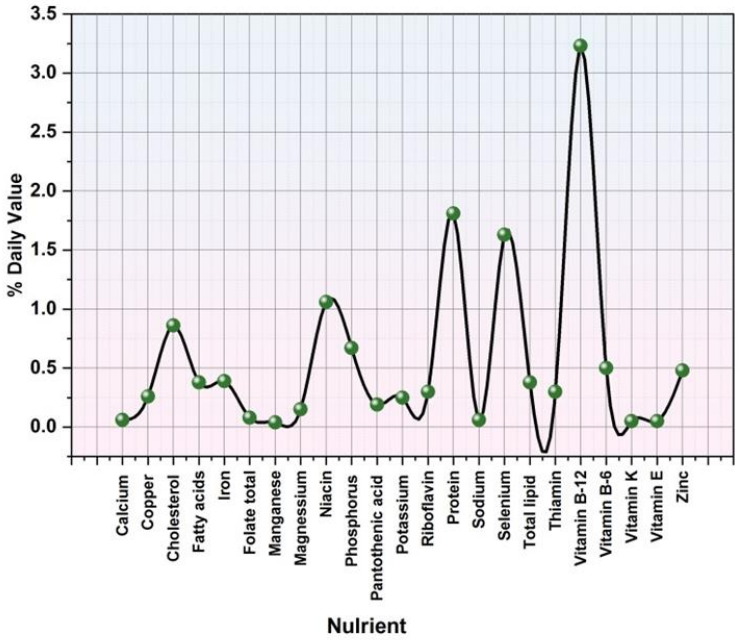

Figure (3). Information on the nutritional content of rabbits

(Source: http://www.wagonhoffermeats.com/rabbit-facts.html)

Overall, the variations in preferences across the goods were quite big and very significant (Figure (4)). Respondents can mark more than one product in the multiple-choice question. The findings indicate that buyers of live bunnies were a very small minority. It is assumed that they have no desire to engage with the killing and preparation of animals. Consequently, it can be concluded that four times as many respondents selected fresh meat as frozen. The complete carcass was favoured by one-third of the respondents, while the fore leg was not a preferred mode of purchase. Of the cut-up items, the thighs received the largest proportion, followed by the loin. However, keep in mind that as thighs are rarely boned, the generally preferred boneless meat is predominantly loin (fillet). Of the processed options mentioned, roasted beef was the most popular, with just a small percentage of respondents selecting the canned option. In whatever scenario or format, 7.3% of respondents said they "would not buy."

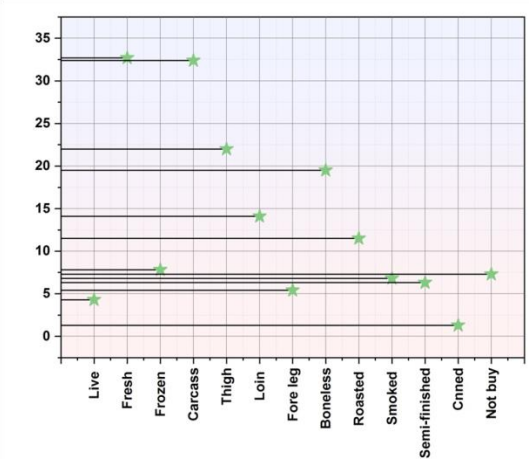

Figure (4). Different forms of rabbit meat influence consumers' purchasing choices

(Source: https://www.mdpi.com/2304-8158/9/5/654)

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CONCLUSION

Marketers ought to divide clients into homogeneous groups to provide rabbit meat that satisfies consumer expectations and tastes. To determine factors that affect the choice of rabbit meat, customers might be specifically divided based on lifestyles or reasons for food selection. Furthermore, the regional source of rabbit meat would be a significant lever to enhance the food system's sustainability in terms of economy, society and the environment. Customers can value products that are certified organic, since this ensures higher standards for protecting the environment and the well-being of animals. The results could help in the development of a plan by the customer chain and other stakeholders to boost the consumption of rabbit meat. When combined with informational initiatives aimed at increasing consumer awareness of the benefits of rabbit flesh, all of these product methods can help the market grow.

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