

RABBIT MEAT QUALITY FACTORS, HEALTH BENEFITS AND IMPORTANCE: A REVIEW

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ABSTRACT

This review was conducted to examine the nutritional importance, compositional characteristics and health benefits of rabbit meat, as well as its relevance to food security and sustainable livestock production. The review was based on data obtained from peer-reviewed scientific journals, technical reports and nutritional databases published between 2010 and 2024. Information on the chemical composition, health implications and functional properties of rabbit meat was extracted, analyzed and summarized in tabular form. Comparative evaluation of the values reported across different studies was carried out to identify common nutritional trends and to highlight the importance of rabbit meat relative to other conventional meats. Findings from reviewed studies indicate that rabbit meat is highly nutritious, lean and easily digestible. It contains between 18.6 and 22.4 g of protein and only 0.5 to 6.3 g of total fat per 100 g of meat, making it an ideal low-fat animal protein source. The energy value ranges from 86 to 161 kcal per 100 g, while moisture content is between 69.6 and 79.3 g per 100 g, contributing to its tenderness and juiciness. The cholesterol content varies from 24 to 120 mg per 100 g, which is considerably lower than that of beef or pork, making it suitable for individuals concerned about heart health. Rabbit meat also contains essential minerals such as potassium (330–430 mg), phosphorus (213–263 mg), iron (1.6–3.0 mg) and selenium (24–39 µg) per 100 g, along with vitamin B12 (4–7 µg per 100 g), which plays a vital role in red blood cell formation and energy metabolism. The fatty acid composition reveals a favorable balance with 30–42% saturated fatty acids (SFA), 25–32% monounsaturated fatty acids (MUFA) and 25–40% polyunsaturated fatty acids (PUFA), with an n-6 to n-3 ratio ranging from 5:1 to 10:1. This composition supports cardiovascular health, weight management and metabolic efficiency. In addition to its nutritional benefits, rabbit production offers economic and environmental advantages due to high reproductive rates, efficient feed conversion and a low ecological footprint, making it an important contributor to sustainable livestock systems. It was concluded that, rabbit meat represents a sustainable and nutritionally valuable source of animal protein that can help address dietary deficiencies and promote healthier living. It was recommended that, there should be increased public sensitization and nutritional education to promote awareness of the health and economic benefits of rabbit meat.

Keywords: Health Benefits , Importance, Rabbit meat, Quality factors,

1.0 INTRODUCTION

Rabbit meat is increasingly recognized as a valuable and underutilized source of animal protein with characteristics that align with modern dietary and sustainability demands. Compared with conventional red meats, rabbit meat is naturally lean, low in cholesterol and sodium and rich in high-biological-value protein and polyunsaturated fatty acids attributes that make it particularly attractive to health-conscious consumers and nutritionists (Dalle Zotte and Szendrő, 2019; Nistor *et al.*, 2021). The quality

of rabbit meat is influenced by several interrelated factors, including breed and genotype, nutrition, housing and welfare conditions, age at slaughter and post-slaughter processing. These factors significantly affect the proximate composition, fatty acid profile, sensory characteristics (such as tenderness, juiciness and flavour) and overall shelf life of rabbit meat (Gugolek *et al.*, 2020; El-Deek *et al.*, 2022). Moreover, feeding

strategies that incorporate functional ingredients, such as herbs, probiotics, or oil seeds, have been shown to enhance meat oxidative stability and nutritive value (Trocino and Xiccato, 2020; Khalil *et al.*, 2023).

From a nutritional and public health perspective, rabbit meat offers unique benefits. It contains a high proportion of essential amino acids, favourable n-6/n-3 fatty acid ratios and high digestibility, making it suitable for children, elderly people and individuals with cardiovascular risks (Nistor *et al.*, 2021; Adeyemi *et al.*, 2022). Additionally, rabbit meat provides considerable amounts of vitamins B12 and B3, phosphorus, selenium and other minerals essential for human metabolism (Dalle Zotte *et al.*, 2021). Beyond nutrition, rabbit production contributes significantly to socio-economic development and environmental sustainability. Rabbits have high reproductive efficiency, short generation intervals and require limited space and feed resources, making them suitable for smallholder farmers and urban production systems (Onyimonyi and Ugwu, 2020; Okeudo *et al.*, 2022). Consequently, rabbit farming serves as a practical tool for improving rural livelihoods, reducing poverty and addressing protein deficiency in developing nations, particularly in Sub-Saharan Africa (Ahemen and Abu, 2021; Adegbeye *et al.*, 2023). The main objective of this review is to examine the factors influencing the quality of rabbit meat, its health benefits and its overall importance to human nutrition and sustainable livestock production. The above is apt because, Rabbit meat has gained increasing attention as a potential solution to the growing demand for healthy and sustainable animal protein. However, despite its numerous nutritional advantages and adaptability to various production systems, rabbit meat remains underexploited and under-consumed, particularly in developing countries such as Nigeria. This

review is therefore justified by the need to create greater awareness of the nutritional, health and economic potentials of rabbit meat and to consolidate recent scientific findings that support its wider adoption (Ahemen and Abu, 2021; Adegbeye *et al.*, 2023). In many regions, livestock production faces challenges related to high feed costs, environmental pressures and the increasing demand for leaner and healthier meat options. Rabbits offer a viable alternative due to their efficient feed conversion rate, high reproductive capacity and low environmental footprint compared with other livestock species (Okeudo *et al.*, 2022; Trocino and Xiccato, 2020). Reviewing the factors that influence meat quality such as genetics, nutrition and management provides a scientific basis for improving production practices and ensuring consistent product quality (Gugolek *et al.*, 2020; El-Deek *et al.*, 2022). Furthermore, rabbit meat is rich in high-quality protein, essential amino acids, vitamins and unsaturated fatty acids, yet consumer awareness of its health benefits remains limited. By reviewing existing literature on the nutritional composition and health implications of rabbit meat consumption, this review seeks to bridge the knowledge gap between scientific evidence and public perception (Dalle Zotte and Szendrő, 2019; Nistor *et al.*, 2021; Adeyemi *et al.*, 2022). Finally, the review is justified by the need to highlight the socio-economic importance of rabbit production in enhancing food security, generating rural income and promoting sustainable animal agriculture. Synthesizing recent research on rabbit meat quality, health benefits and importance will not only guide producers, researchers and policymakers but also stimulate further studies and investments aimed at promoting rabbit production as a reliable and sustainable source of animal protein (Onyimonyi and Ugwu, 2020; Adegbeye *et al.*, 2023)

2.0 METHODOLOGY.

Literature materials were sourced from journal , conference proceedings , books and from the internet, they were collated, categorized, reviewed and discussed

3.0 REVIEW OF LITERATURE

3.1 Rabbit Production in Nigeria

Rabbit production in Nigeria plays a significant role in the development and provision of food and family income (Salihu and Abdulrahman, 2020).

Rabbit has been identified as an economic livestock that can adequately meet the animal protein requirement of Nigerians due to its ability to convert feeds that are not directly utilized by man. In most developing countries like Nigeria, there is insufficient intake of animal protein due to low animal productivity (Wafar *et al.*, 2019). Over the years, rabbit farming has grown from raising a few rabbits for family consumption to large commercial operations with hundreds of rabbits.

Table 1: Rabbit meat production in the world

Continent/Country	2010	2015	2020
Asia	828,586.09	940,767.28	634,024.78
China	690,000.00	783,457.38	488,000.00
North Korea	133,900.00	153,878.11	142,793.92
Europe	260,672.91	256,647.84	153,150.08
European Union	230,582.91	223,237.64	121,433.79
Russian Federation	14,429.00	17,374.00	18,364.00
Africa	78,638.00	92,794.85	97,122.49
Egypt	52,282.00	64,946.00	69,144.76
Algeria	7,500.00	8,223.70	8,428.45
Sierra Leone	7,600.00	7,920.06	8,103.75
Americas	17,549.50	17,016.53	15,429.12
Mexico	4,350.00	4,399.96	4,481.78
Peru	3,360.00	3,359.13	3,402.13
Colombia	3,185.00	3,182.25	3,212.37
World	1,185,446.51	1,307,226.51	899,726.47

Source: FAOSTAT (2020)

Expansion is much simpler than other livestock alternatives because a large range of existing facilities can be modified for rabbits and land requirements are negligible (Robert *et al.*, 2008). The human population growth in developed countries is stabilizing while that of developing

countries including Nigeria is still increasing rapidly. Thus, the search for alternative sources of protein to meet up this growing population challenge is imperative. Among such alternatives is the use of livestock species that are yet to be known

to play a major role in animal production within these countries is very important. Fast-growing livestock such as rabbits possess a certain number of features that might be of advantage in the small holder subsistence. Rabbit farming is one of the fastest growing micro-livestock enterprises in most countries. Rabbit is preferred as a sustainable source of proteins in an era where concerns over climate change, population and changing meat consumption patterns are growing in developing countries (Chrispinus and Stephen 2020). Additionally, increase in income, growing urbanization, and unfolding globalization are the common factors boosting the demand for high-value commodities including meat due to these fast socio-economic changes in the recent past (Chrispinus and Stephen, 2020). In Nigeria, consumption of animal protein remains very low, at about 6.0-8.4 g/head/day which are far below the 13.5 g/head/day (World Health Organization) and (Amata and Brat, 2008). Diversification into rabbit production sector appears to be gaining popularity and economic importance as a means of alleviating animal protein deficiency in Nigeria compared to the conventional sources that come from goat, sheep and cattle in many developing countries (Ume *et al.*, 2017). However, rabbits are perhaps the most economical and profitable of all kinds of livestock as it can utilize inferior feeds and still provide quality meat and fur. Moreover, with a better-quality feeding program, there will be high increase in production, thus allowing a higher profit margin for the producer (Ikhimalo *et al.*, 2006). The management of rabbit is done on a small-scale mostly by peasant farmers for many different purposes; they can play a very significant role in a small sustainable family operation. While the most common use in agricultural industries is for meat, rabbit also is raised for pets, by product for manure in gardens, show, and laboratory uses. Rabbit meat is high in protein 33 g (66 %) and low in fat, 3.5 % (5 %) calories 173 and cholesterol 123 mg (41 %), when compared to most of the meat eaten (Victoria, 2020). Rabbits are prolific and will breed all year-round if well managed (Salihu and Abdulrahman, 2020).

3.1.1 Nutrition and Dietary Manipulation

Nutrition is one of the most effective means of modifying the composition and quality of rabbit meat. The balance of energy and protein in feed determines growth rate and carcass fat content, while the inclusion of certain ingredients can alter the fatty acid profile. Supplementation with sources of omega-3 fatty acids such as linseed, flaxseed, fish oil, or marine algae enhances the nutritional value of the meat by improving the ratio of omega-6 to omega-3 fatty acids (Agradi, 2023). However, these polyunsaturated fatty acids are more prone to oxidation, which can affect flavour and shelf life. Including antioxidants such as vitamin E or plant polyphenols in the diet helps preserve meat quality by reducing oxidation and improving colour stability (Daboussi, 2025). Probiotics and prebiotics have also been found to influence gut health and may improve meat sensory properties through modulation of metabolic processes. Feeding is key for reproduction, and certain ingredient has been known to influence it. Feed is the most important input in a profitable livestock production; it accounts for 70-80% of the total cost of production. High cost of feeding has continued to remain a major impending factor in intensive animal production. Therefore, it is imperative to explore the use of nonconventional feedstuffs that are cheap. Nutritionally adequate and readily available (Wafar *et al.*, 2019). Rabbits have unique digestive physiology that requires careful balancing of dietary fiber, protein, energy, and supplemental nutrients. Dietary composition directly influences feed intake, nutrient digestibility, and production outcomes such as growth and FCR. Research demonstrates that optimizing fiber and protein levels improves nutrient utilization, while excessive fiber or imbalanced dietary components reduce digestive efficiency. Rabbits are hindgut fermenters that rely on microbial fermentation in the cecum to break down fibrous plant components. While rabbits can digest proteins efficiently, their ability to digest structural carbohydrates (fiber) differs significantly from ruminants, impacting nutrient utilization.

Feeding strategies that balance fiber with digestible carbohydrate and protein sources enhance nutrient utilization and economic viability. Digestibility responses to diet changes inform practical formulation for both commercial and subsistence rabbit production systems. Dry matter intake (DMI) is influenced by diet composition, especially fiber and energy density. Diets with excessive neutral detergent fiber (NDF) may reduce DMI and digestibility. In trials evaluating forage and legume diets in wild rabbits, dry matter, nitrogen, and energy assimilation correlated with fiber content – higher fiber often corresponds to slower digestion rates. Dietary modifications such as supplemental corn, additives, or leaf meals impact intake and digestibility. For example, supplemental corn in forage diets can influence feed intake and improve apparent nutrient digestibility metrics. Mineral levels (e.g., iron) in diets can affect intake, average daily gain, and digestibility coefficients — moderate iron supplementation has been shown to help crude protein digestion. Digestibility coefficients are vital for understanding feed efficiency. Increased NDF leads to reduced digestibility of dry matter (DM), organic matter (OM), and fiber itself. High fiber particularly reduces overall nutrient utilization and daily weight gain. In a controlled feeding study, inclusion of cassava leaf meal (CLM) at increasing levels reduced DMI and nutrient digestibility. The highest digestibility was seen at lower CLM levels (15–30 %) while excessive inclusion (e.g., 60 %) detrimentally affected both intake and digestion. Methods used across studies typically include: Total fecal collection, providing direct measures of nutrient output. Apparent digestibility coefficients for DM, OM, crude protein (CP), and fiber fractions. These enable comparisons between dietary treatments. Better digestibility is generally associated with improved growth performance and lower feed conversion ratios (FCR). Diets optimized for balanced protein, energy, and fiber normally yield higher nutrient absorption and weight gain. Digestibility can vary with

physiological states (e.g., pregnancy, lactation), where energy and protein requirements shift, altering nutrient absorption dynamics.

3.2 Quality Factors of Rabbit Meat

Rabbit meat quality is influenced by a combination of biological and management factors that operate from production to processing. These factors determine the composition, texture, colour, flavour and nutritional value of the meat. They also affect its oxidative and microbial stability, which in turn influences consumer acceptability and market demand. Generally, the major determinants of meat quality include genetics, nutrition, age, sex, housing, welfare, handling, slaughtering methods and post-mortem processing conditions (Kumar, 2023; Liu, 2022).

3.2.1 Genetics and Breed

The genetic background of rabbits plays a major role in determining carcass composition, growth rate and meat characteristics. Meat-type breeds are often superior in growth and carcass yield compared to local breeds. Genetic selection affects muscle fibre type, fat deposition and metabolic activities, which influence pH, tenderness and colour. However, the performance of a breed also depends on environmental conditions, management and nutrition. Therefore, selection programs should target both productivity and meat quality traits while maintaining local adaptability and genetic diversity (Kumar, 2023; Goswami, 2024).

3.2.2 Age, Sex and Physiological Status

Age at slaughter affects the tenderness, fat content and flavour of rabbit meat. Younger rabbits produce more tender meat with less intramuscular fat, while older animals yield firmer meat with stronger flavour. Sex and physiological condition may also influence carcass characteristics, with males often having leaner meat than females. Slaughtering at an appropriate age helps achieve a balance between growth efficiency and desired meat quality (Liu, 2022).

3.2.3 Housing, Stocking Density and Welfare

Housing systems and welfare conditions influence meat quality by affecting stress levels and muscle metabolism. Overcrowding, poor ventilation, or temperature stress can lead to pre-slaughter fatigue and inconsistent pH decline, resulting in darker and drier meat. On the other hand, rabbits raised in enriched environments or free-range systems often show better welfare, though excessive activity can sometimes cause tougher meat. Maintaining good housing, proper space allowance and environmental control is therefore essential for consistent meat quality (Kumar, 2023).

3.2.4 Pre-slaughter Handling and Slaughter Methods

Pre-slaughter management such as transportation, handling and lairage conditions can greatly influence meat quality. Stressful conditions reduce muscle glycogen levels and affect the biochemical changes that occur after death, leading to poor water-holding capacity and reduced tenderness. Proper handling, minimal transport time and humane slaughter methods improve both animal welfare and meat quality (Kumar, 2023).

3.2.5 Post-mortem Processing and Ageing

Post-mortem factors such as chilling rate, ageing and processing methods determine the final texture, juiciness and flavour of rabbit meat. Controlled ageing allows natural enzymes to tenderise the meat, but prolonged storage can increase oxidation, particularly in meat with high unsaturated fat content. Optimising ageing time and using antioxidants help achieve the desired tenderness while preserving freshness and colour stability (Liu, 2022).

3.2.6 Packaging, Storage and Shelf Life

Packaging and storage are critical for maintaining the quality and safety of rabbit meat. Vacuum packaging and modified atmosphere packaging are effective methods for extending shelf life and preserving freshness. Vacuum packaging reduces oxidation and microbial growth, while modified atmosphere packaging maintains meat colour by using a controlled gas

mixture. Proper storage temperature and handling practices further prevent spoilage and maintain sensory qualities. Innovations such as active packaging with oxygen absorbers or antimicrobial agents have shown promise in extending the shelf life of fresh rabbit meat (Castrica, 2025; Racewicz, 2023).

3.2.7 Microbiological and Oxidative Stability

Due to its relatively high unsaturated fat content, rabbit meat is susceptible to lipid oxidation and microbial contamination. Lipid oxidation results in rancid flavour and colour deterioration, while microbial spoilage reduces shelf life and poses health risks. Ensuring hygienic slaughtering, rapid chilling, the use of dietary antioxidants and proper packaging all contribute to maintaining oxidative and microbial stability. Combined approaches that integrate nutritional, processing and storage strategies have been shown to be most effective (Siudak, 2023).

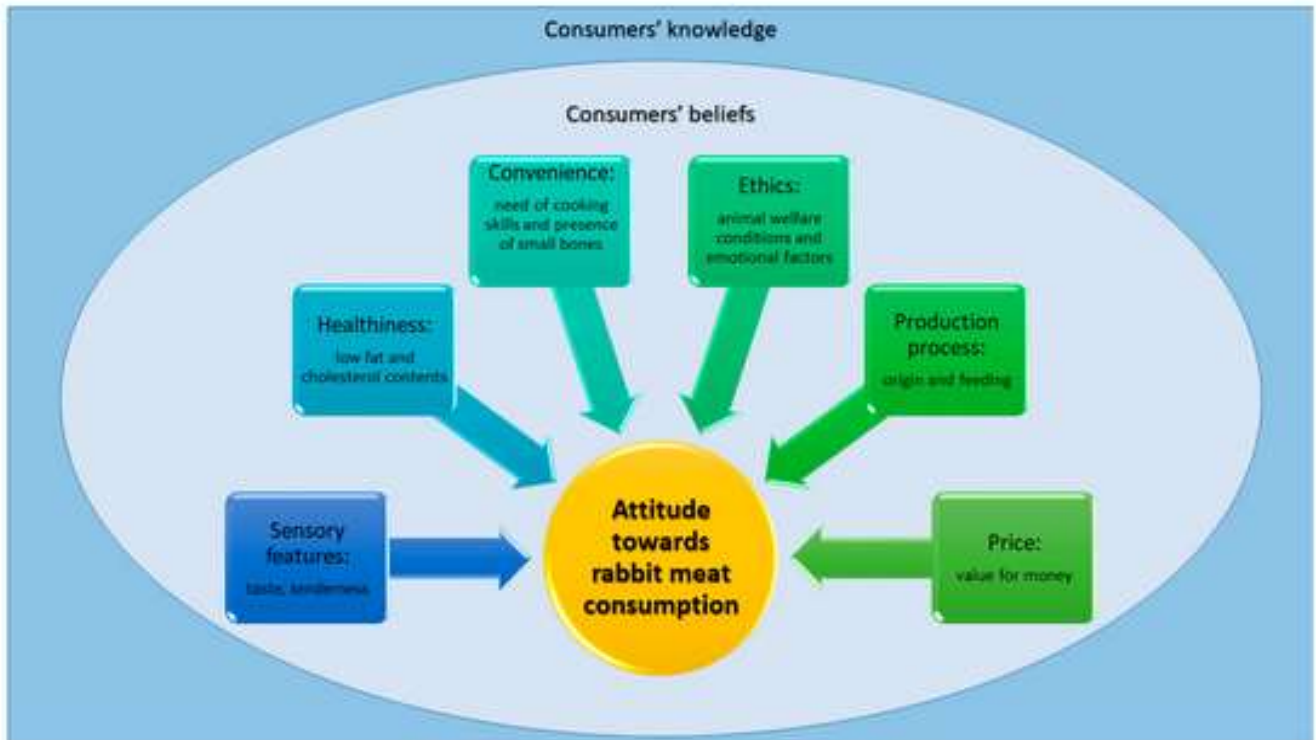
3.2.8 Muscle-Specific Differences and Product Tailoring

Different muscles in the rabbit carcass vary in fibre composition, fat content and collagen level, which affect tenderness and flavour. For instance, the loin and hind leg muscles differ in water-holding capacity and cooking loss. Understanding these differences enables processors to apply specific cooking or processing techniques for each cut, enhancing product value and consumer satisfaction (Kumar, 2023).

3.2.9 Consumer Perception and Organoleptic Properties

Consumer perception of rabbit meat is influenced by sensory attributes such as tenderness, juiciness and flavour. Some consumers associate rabbit meat with distinct flavours described as “gamey,” which can affect acceptance. Factors such as diet composition, age and storage conditions influence these sensory characteristics. Conducting sensory evaluation alongside instrumental analyses helps identify consumer preferences and guide processing methods that enhance product appeal (Liu, 2022).

Figure 1. Consumers' beliefs have an impact on their attitudes toward rabbit meat consumption.



3.2.10 Integrated Farm to Fork Strategies

Because the quality factors of rabbit meat are interrelated, an integrated approach that combines genetics, nutrition, housing, welfare and processing is most effective. Coordinated management of all production stages ensures consistent, safe and nutritious meat that meets consumer expectations. Research continues to explore how combinations of these strategies can optimise both nutritional value and sensory quality while reducing post-harvest losses (Agradi, 2023; Castrica, 2025).

3.3 Health Benefits of Rabbit Meat

Rabbit meat is increasingly recognized as a healthy alternative to other animal protein sources due to its unique nutritional composition, low fat content, favourable fatty acid profile and bioactive components that contribute to human health. Its consumption is associated with benefits for cardiovascular health, weight management, metabolic function and general well-being. Recent studies highlight the potential of rabbit meat to support dietary strategies aimed at reducing chronic disease risk while providing high-quality protein (Adeyemi *et al.*, 2022; Dalle Zotte and Szendrő, 2019).

Table 2: Nutritional composition of different parts of rabbit meat.

Compounds	Fore Part	Hind Part	References
Protein (weight %)	16.5–21.8	18.2–22.1	(Forrester-Anderson <i>et al.</i> , 2006)
Moisture (weight %)	69.6–79.1	73.8–79.3	(Cesari, <i>et al.</i> , 2018)
Fat (weight %)	0.8–8.0	0.5–3.7	(Mondin <i>et al.</i> , 2021)
Carbohydrate (weight %)	0.1–0.6	0.1–0.6	(Fadlilah <i>et al.</i> , 2020)
Gross energy (Kcal/100 g)	86.3–161.3	85.8–118.9	(Fadlilah <i>et al.</i> , 2020)
Cholesterol (mg/100 g)	24.2–103.4	25.0–120.3	(Rasinska <i>et al.</i> , 2018)
LDL (mg/100 g)	5.8–26.5	3.6–78.4	(Dal Bosco <i>et al.</i> , 2014)
HDL (mg/100 g)	5.9–32.7	5.5–35.7	(Rasinska <i>et al.</i> , 2018)
SFA (mg/100 g)	32.5–41.7	35.7–42.4	(Dal Bosco <i>et al.</i> , 2014)
MUFA (mg/100 g)	25.7–31.8	26.1–31.2	(Fadlilah <i>et al.</i> , 2020)
EPA (mg/100 g)	0.1–1.1	0.0–1.1	(Dal Bosco <i>et al.</i> , 2014)
DHA (mg/100 g)	0.2–0.6	0.2–0.7	(Fadlilah <i>et al.</i> , 2020)

Table 3: Major factors affecting rabbit meat and carcass quality.

Risk Factors	Housing System	Rabbit Type	Behavior Related	Health-Related
Housing	Conventional cages	Young	Resting	Hunger/Thirst
Genetics	Structurally enriched cages	Old	Fear	Injuries
Nutrition	Floor pens	Small in size	Restriction of movement	Skin lesions
Feeding	Elevated pens	Large in size	Small space	Reproductive disorders
Biosecurity	Outdoor systems	—	—	Heat stress
Reproduction management	Self-made system	—	—	Cold stress
Ambient conditions	—	—	—	Mastitis

Source: Saxmose Nielsen *et al.* (2020)

3.3.1 Nutritional composition

Rabbit meat is a lean meat with high protein content, low total fat and low cholesterol levels, making it suitable for health-conscious consumers and individuals with cardiovascular concerns. Its protein contains all essential amino acids in a highly digestible form, which supports muscle growth, repair and overall metabolic function. Studies show that the protein efficiency ratio of rabbit meat is comparable to or higher than that of chicken, beef, or pork, making it an excellent dietary protein source (Adeyemi *et al.*, 2022; Nistor *et al.*, 2021). In addition to protein, rabbit meat contains significant amounts of essential minerals including iron, zinc and selenium. Iron is necessary for hemoglobin formation and oxygen transport, zinc supports immune function and wound healing and selenium has antioxidant properties that protect cells from oxidative stress. Vitamins such as B-complex vitamins, especially B12 and niacin, are also abundant in rabbit meat, contributing to energy metabolism and neurological health (Onyimonyi and Ugwu, 2020).

3.3.2 Low-fat content and favourable fatty acid profile

One of the most distinctive health benefits of rabbit meat is its low total fat content, typically ranging from 2 to 8 percent, depending on breed, diet and management. The fat that is present is highly unsaturated, with a balanced ratio of omega-6 to omega-3 polyunsaturated fatty acids. Diets rich in omega-3 fatty acids are associated with reduced risk of cardiovascular disease, anti-inflammatory effects and improved lipid metabolism. Feeding strategies that enhance omega-3 content further improve the nutritional quality of rabbit meat without increasing total fat or cholesterol (Agradiet *al.*, 2023; Dalle Zotte and Szendrő, 2019). The low saturated fatty acid content in rabbit meat is another advantage for cardiovascular health. Regular consumption of rabbit meat in place of red meats with high

saturated fat has been suggested to lower serum cholesterol and reduce the risk of atherosclerosis (Adeyemi *et al.*, 2022).

3.3.3 Role in weight management and metabolic health

Rabbit meat is highly suitable for individuals seeking to control body weight due to its high protein content and low energy density. Protein-rich foods increase satiety, reduce overall energy intake and support lean muscle maintenance during calorie restriction. Its low fat and cholesterol content, combined with high digestibility, makes rabbit meat ideal for diets designed to prevent obesity and associated metabolic disorders such as type 2 diabetes (Nistor *et al.*, 2021).

The favourable fatty acid composition, including higher omega-3 content, can also help modulate lipid profiles, reduce systemic inflammation and improve insulin sensitivity. These properties make rabbit meat a valuable component of functional diets aimed at promoting metabolic health.

3.3.4 Antioxidant and bioactive properties

Rabbit meat contains naturally occurring antioxidant compounds such as selenium and certain peptides derived from protein hydrolysis. These components help neutralize free radicals, reducing oxidative stress and the risk of chronic diseases such as cardiovascular disease and cancer. Additionally, dietary interventions in rabbit production, such as supplementation with vitamin E or plant polyphenols, further enhance the oxidative stability and antioxidant capacity of the meat (Siudak, 2023; Daboussi, 2025). The presence of bioactive peptides in rabbit meat, which are released during digestion, may exert immunomodulatory and antihypertensive effects. These bioactive compounds contribute to the growing interest in rabbit meat as a functional food with health-promoting properties.

3.3.5 Suitability for special diets

Because of its low fat, low cholesterol and high protein content, rabbit meat is suitable for special dietary needs. It can be recommended for the elderly, individuals recovering from illness, athletes and people managing chronic conditions

such as cardiovascular disease or obesity. Its high digestibility and low allergenicity compared to other meats further enhance its suitability as a nutritional intervention for vulnerable populations (Onyimonyi and Ugwu, 2020; Adeyemi *et al.*, 2022).

Table 4: Nutritional advantages of rabbit meat (key nutrients and traits)

Nutrient / Trait	Typical Value or Trait (per 100 g)	Why It Matters	Authors
High-quality protein	Approximately 25–28 g protein; high biological value	Supports muscle maintenance and growth; excellent amino acid profile	Suvajdžić <i>et al.</i> , 2023
Low total fat	Lower fat content than most red meats; rabbit considered lean	Low calorie density; helps in weight control and metabolic health	Etukudo <i>et al.</i> , 2024
Lower cholesterol	Rabbit meat contains less cholesterol than beef or pork	Reduces dietary cholesterol intake and supports cardiovascular health	Abdullatif <i>et al.</i> , 2023
Favorable PUFA profile (n-3 enrichment possible)	Can be enriched via feed to increase omega-3 fatty acids	Improves omega-6 : omega-3 ratio and supports heart health	Hernández & Dalle Zotte, 2010
Low sodium / high potassium	Sodium: 37–50 mg; Potassium: 428–431 mg (per 100 g)	Supports blood-pressure regulation and hypertension management	Cullere <i>et al.</i> , 2024
Rich in B-vitamins and minerals	Excellent source of vitamin B12, phosphorus, iron and zinc	Supports energy metabolism, red-blood-cell formation and bone health	Dalle Zotte & Szendrő, 2011

3.4 Importance of Rabbit Meat

Rabbit meat is a valuable source of animal protein that offers multiple nutritional, economic and environmental advantages. Its importance spans human health, food security, sustainable livestock production and socio-economic

development. Unlike conventional livestock, rabbits have unique biological and reproductive traits that make them efficient and adaptable protein sources for a wide range of production systems (Dalle Zotte and Szendrő, 2019; Adegbeye *et al.*, 2023).

Table 5: Reported health benefits and functional implications of rabbit meat

Health Area	Reported Finding	Effect	or Key Evidence Summary	Authors & Year
Cardiovascular health	Lean, low-cholesterol meat; enriched variants	reduce LDL and improve lipid profile	Feeding trials and functional-meat studies show improved lipid markers	Abdullatif <i>et al.</i> , 2023
Hypertension / electrolyte balance	Very low sodium and higher potassium content		Mineral analyses show favorable K : Na ratio for BP control	Cullere <i>et al.</i> , 2024
Digestibility and metabolism	High digestibility and low purine content		Reviews note rabbit proteins are easily utilized and suitable for clinical diets	Dalle Zotte, 2004; Hernández & Dalle Zotte, 2010
Weight / metabolic management	Low fat and calorie levels	make it a healthy red-meat alternative	Comparative studies show lower fat / calorie values than beef	Etukudo <i>et al.</i> , 2024
Functional food potential	Feed enrichment increases n-3 PUFA and selenium content		Studies demonstrate improved fatty-acid profile and meat functionality	Suvajdžić <i>et al.</i> , 2023
Research model relevance	Rabbit's lipid metabolism resembles human profile		Used as translational model for atherosclerosis and metabolic research	Hernández & Dalle Zotte, 2010

3.4.1 Nutritional importance

The consumption of rabbit meat contributes significantly to human nutrition due to its high-quality protein, essential amino acids, low fat and rich micronutrient profile. It provides an excellent alternative to red meat, particularly for individuals seeking lean protein with low cholesterol content. Regular inclusion of rabbit meat in diets can help meet daily protein requirements, support muscle growth and repair and contribute to overall health and well-being (Adeyemi *et al.*, 2022; Nistor *et al.*, 2021).

Rabbit meat is also a source of essential minerals such as iron, zinc and selenium, which are important for oxygen transport, immune function and antioxidant defense. The presence of vitamins, particularly B-complex vitamins, supports energy metabolism, neurological function and red blood cell formation. These nutritional qualities position rabbit meat as a functional food with the potential to improve dietary quality, especially in communities with limited access to diverse animal protein sources (Onyimonyi and Ugwu, 2020).

Table 6: Proximate composition of rabbit meat (raw, typical per 100 g)

Component	Typical value / range (per 100 g)	Unit	Authors
Moisture	69.6 – 79.3	g	Frunză <i>et al.</i> , 2023; Gál, 2022
Protein (total)	18.6 – 22.4	g	Frunză <i>et al.</i> , 2023; Gál, 2022
Total fat (lipids)	0.5 – 6.3	g	Kumar <i>et al.</i> , 2023; Cullere <i>et al.</i> , 2022
Ash	1.1 – 1.3	g	Frunză <i>et al.</i> , 2023
Energy (gross)	86 – 161	kcal	Frunză <i>et al.</i> , 2023; Gál, 2022
Cholesterol	24 – 120	mg	Kumar <i>et al.</i> , 2023

Table 7: Major minerals & selected vitamins in rabbit meat (typical per 100 g)

Nutrient	Typical value (per 100 g)	Unit	Authors
Potassium (K)	330 – 430	Mg	FitAudit / nutrient databases; Hermida, (2006)
Phosphorus (P)	213 – 263	Mg	FitAudit; Hermida, (2006)
Sodium (Na)	37 – 50	Mg	FitAudit; Abdullatif (2023)
Iron (Fe)	1.6 – 3.0	Mg	Abdullatif (2023)
Zinc (Zn)	1.6 – 2.3	Mg	Hermida, (2006)
Selenium (Se)	~24 – 39	µg	Abdullatif (2023)
Vitamin B12	~4 – 7	µg	Abdullatif (2023)

Table 8: Fatty acid / lipid profile (typical values expressed as g/100 g meat or % of total fatty acids where noted)

Lipid / FA class	Typical value or range	Unit / note	Authors
Total fat (repeated)	0.5 – 6.3	g/100 g	Kumar <i>et al.</i> , 2023
SFA (saturated FA)	~30 – 42 % of total FA	% of total fatty acids (range between cuts)	Rasinska, 2018
MUFA (monounsaturated FA)	~25 – 32 % of total FA	% of total fatty acids	Rasinska, 2018
PUFA (polyunsaturated FA)	~25 – 40 % of total FA	% of total fatty acids; varies with diet	Petracci <i>et al.</i>
n-6 / n-3 ratio (native)	~5:1 to 10:1 (native diets)	Ratio	Rasinska, 2018
n-3 PUFA (total)	~0.3 – 2.0	g/100 g fat (depends on diet/enrichment)	Kumar <i>et al.</i> , 2023
EPA + DHA (long-chain n-3)	trace – 0.1	g/100 g meat (low unless enriched)	Rasinska, 2018

Table 9: Health and Metabolic Implications of Rabbit Meat Consumption

Health area	Research finding	Practical implication	Authors
Digestibility & clinical nutrition	Rabbit meat is highly digestible and often recommended in therapeutic diets	Suitable for elderly or convalescent patients	Petracci <i>et al.</i> , 2009; Abdullatif, 2023
Lipid profile and cardiovascular markers	n-3 enriched rabbit meat improves fatty-acid profile and lowers LDL	Improved dietary lipid profiles when substituted for fattier meats	Króliczewska 2018; Petracci 2009
Weight & metabolic management	Lower fat/calorie density relative to many red meats	Useful as a lean-protein option in weight-management diets	Rasinska <i>et al.</i> , 2018; Abdullatif, 2023
Functional food production	Dietary manipulation increases n-3 PUFA and nutraceuticals in meat	Value-added functional rabbit meat with potential health benefits	Agradi <i>et al.</i> , 2020; Petracci <i>et al.</i> , 2009
Mineral/electrolyte benefits	Favorable K:Na balance reported	Helpful in blood pressure control	Abdullatif, 2023

3.4.2 Economic importance

Rabbit production contributes to household income generation and poverty alleviation, particularly in rural and peri-urban communities. Rabbits are small, easy to rear and have a short reproductive cycle, which allows farmers to generate income quickly through meat sales, live animal markets and breeding stock. The relatively low input requirements compared to larger livestock species make rabbit farming accessible to smallholder farmers, women and youth, promoting inclusive economic development (Ahemen and Abu, 2021; Adegbeye *et al.*, 2023). The commercialisation of rabbit meat also supports agro-processing industries, including packaging, frozen meat distribution and ready-to-cook products. By linking production with value addition, rabbit meat farming enhances market opportunities and stimulates local economies.

3.4.3 Environmental and sustainability importance

Rabbits are highly efficient converters of feed into meat. Their feed conversion ratio is lower than that of larger livestock, which means they require less feed to produce a kilogram of meat. Additionally, they occupy minimal space, making them suitable for urban and peri-urban production. The smaller environmental footprint, in terms of land use, water requirement and greenhouse gas emissions, makes rabbit meat production a sustainable alternative to conventional livestock farming (Dalle Zotte and Szendrő, 2019). In regions where conventional livestock production is constrained by land scarcity or feed availability, rabbits provide a sustainable protein source without intensifying pressure on natural resources. Promoting rabbit production can therefore contribute to sustainable livestock systems and climate-resilient agriculture.

3.4.4 Social and food security importance

Rabbit meat plays an important role in enhancing food and nutrition security. Its high reproductive rate and rapid growth allow for regular meat supply throughout the year, ensuring consistent protein availability. In low-income households,

rabbits can be reared with minimal capital investment and provide a ready source of high-quality meat for family consumption or sale (Ahemen and Abu, 2021; Adegbeye *et al.*, 2023). The short generation interval of rabbits also makes them a valuable tool for improving dietary diversity, particularly in communities where other sources of animal protein are scarce. By increasing access to affordable, nutrient-rich meat, rabbit production contributes directly to the reduction of protein-energy malnutrition and supports overall community health.

3.4.5 Cultural and culinary importance

Rabbit meat is culturally acceptable in many regions and is used in traditional and modern cuisines. Its mild flavour, tenderness and versatility allow it to be prepared using various cooking methods such as stewing, roasting and grilling. Culinary adaptability enhances its marketability and provides opportunities for gastronomy, processed meat products and niche markets targeting health-conscious consumers (Nistor *et al.*, 2021; Adeyemi *et al.*, 2022). Consumer perception of rabbit meat as a healthy and premium protein source further drives its demand in both domestic and international markets. Its integration into diverse diets promotes healthier eating habits while expanding market opportunities for producers.

3.4.6 Contribution to food security and nutrition

Beyond individual health benefits, rabbit meat plays an important role in improving food and nutrition security. Its rapid growth, high reproductive rate and efficient feed conversion allow for reliable production of high-quality protein even in resource-limited environments. Promoting rabbit meat consumption can help address protein-energy malnutrition, especially in developing countries where access to lean, high-quality meat is limited (Ahemen and Abu, 2021; Adegbeye *et al.*, 2023). The nutritional profile of rabbit meat, coupled with its ease of production and sustainability, positions it as a strategic food source for improving population health while supporting income generation and rural livelihoods.

Table 10: Production, Socioeconomic and Environmental Importance

Area	Research finding	Why it matters (implications)	Authors
Small-scale / rural livelihoods	Rabbit production suits smallholders; low space, faster turnover	Supports rural livelihoods, poverty alleviation	Siddiqui <i>et al.</i> , 2023; Kumar <i>et al.</i> , 2023
Resource efficiency & sustainability	Favorable feed conversion, lower water/land needs	Lower environmental footprint; sustainable protein source	Etukudo, 2023; Siddiqui, 2023
Food security & diversification	Locally producible alternative animal protein	Enhances household food security and protein access	Siddiqui <i>et al.</i> , 2023
Processing & value chain potential	Possibilities for functional and processed rabbit products	Value-addition improves marketability and farmer incomes	Petracci <i>et al.</i> , 2009; recent product reviews

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

From the review carried out, it can be concluded that;

Rabbit meat represents a highly nutritious, sustainable and economically viable source of animal protein with distinct advantages over conventional livestock meats. Its superior nutritional profile marked by high-quality protein, low fat and cholesterol levels and favourable fatty acid composition makes it beneficial for cardiovascular health, weight management and overall metabolic well-being. The meat's richness in essential minerals and vitamins further enhances its value in supporting human nutrition, particularly in populations vulnerable to nutrient deficiencies. Beyond nutrition, rabbit production contributes to poverty reduction, food and nutrition security and environmental sustainability due to the species' efficient feed utilization, high reproductive rate and low ecological footprint. Existing research highlights that strategic improvements in genetics, feeding, welfare and processing can further enhance rabbit meat quality and consumer acceptability.

4.2 Recommendations

The review recommended that,

1. There should be increased public education and awareness campaigns to highlight the nutritional and health benefits of rabbit meat, particularly in regions where consumption remains low.
2. Further research should be conducted to optimize feeding strategies, genetic improvement and processing methods that enhance meat quality, functionality and shelf life.
3. Governments and development agencies should incorporate rabbit production into national livestock and food security policies, providing technical support, access to credit and effective extension services.
4. The development of value-added rabbit meat products, along with improved processing, packaging and marketing systems, should be encouraged to boost consumer acceptance and profitability.
5. Rabbit production should be integrated into climate-smart agricultural programs to promote environmental sustainability and efficient resource use.

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