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Meat Quality in Rabbit (*Oryctolagus cuniculus*) and Hare (*Lepus europaeus Pallas*)—A Nutritional and Technological Perspective

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Abstract: This study aimed to nutritionally and technologically characterize the meat produced by rabbit (*Oryctolagus cuniculus*, Flemish Giant breed, 50 farmed individuals) and hare (*Lepus europaeus Pallas*, 50 hunted individuals). Muscles were sampled from several carcass regions: dorsal torso—*Longissimus dorsi* (LD), thigh—*Semimembranosus* (SM), and upper arm—*Triceps brachii* (TB). To better depict the meat's nutritional quality, the proximate composition and fatty acid profile were assessed, and then gross energy content and lipid sanogenic indices (Polyunsaturation—PI, atherogenic—AI, thrombogenic—TI, hypocholersyerolemic/hypercholesterolemic ratio—h/H, Nutritional Value Index—NVI) were calculated. pH values at 24 and 48 h post-slaughter, cooking loss (CL), and water-holding capacity (WHC) were the investigated technological quality traits. Gross energy was higher in rabbit TB samples, compared with hare, due to more accumulated lipids ($p < 0.001$). pH value was higher for TB muscles in both species; the WHC was higher for hare ($p < 0.001$), and CL was higher for rabbit ($p < 0.001$). The PI values were 6.72 in hare and 4.59 in rabbit, AI reached 0.78 in hare and 0.73 in rabbit, TI was calculated at 0.66 in hare and 0.39 in rabbit, and the h/H ratio reached 3.57 in hare and 1.97 in rabbit, while the NVI was 1.48 in hare and 1.34 in rabbit samples. Meat from both species is nutritionally valuable for human consumers, meeting nutritional values better than the meat of farmed or other wild species of fowl and mammals. Hare meat was found to be healthier than rabbit in terms of lower fat content, lighter energy, and better lipid health indices.

Keywords: meat; rabbit; hare; nutritional quality; lipid health indices; water-holding capacity; cooking loss

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1. Introduction

Accentuated growth of both world population and life expectancy could lead to a future "food crisis". Whilst the demand for animal protein increases, the conventional sources are insufficient, and areas for agriculture and fodder crop usage have become less available. The UN predicted a world population size of 9.6 billion by 2050, suggesting a necessity to increase food and feed production [1,2]. Rabbit breeding in developing countries has helped many people out of poverty. According to the FAO, the world supply of rabbit meat issued from Europe increased (>80%) between 1961–1985. The rabbit industry in Asia has also grown rapidly throughout the past 30 years [2]. Recent studies [3–7] report that rabbit meat yield and consumption have risen in countries such as China and Mexico, while in the European countries that were the usual consumers (Italy, Poland, France, and Spain) a significant reduction was observed [1–7]. In 2018, global rabbit meat output reached 1.39 million tonnes, out of which the European countries represented 19.43%, while Asian countries were predominant (72.71%) [2]. In addition, young people orient toward

other types of meat and pre-cooked products, rather than consuming rabbit meat, which is more laborious to cook [4]. Rabbits are usually sold as pre-packed whole carcasses or cut up (hind legs and loin). Designing food products containing rabbit meat could be a response to increasing consumers' repeatable satisfaction when buying such products [4,5]. Rabbit meat is considered a functional food due to its high nutritional properties [8–12]. It is a source of low allergenic valuable proteins with high nutritional value (essential amino acids), and it has a sanogenic lipid profile, i.e., low levels of fat and cholesterol (dietetic meat) [9,13,14], due to its high content of unsaturated fatty acids (UFA, especially ω-3 and ω-6) and a good ratio of polyunsaturated fatty acids (n-6/n-3, PUFA) [15–17]. It is also a very good source of minerals (P, K, Ca, Se, and Co) and has the highest concentration of Fe (2.9 mg/100 g for hare to 4.9 mg/100 g hare and rabbit meat together) [8,9] vs. any other type of meat (2.6 mg/100 g beef, 1.9 mg/100 g lamb, 1.3 mg/100 g chicken, 0.9/100 g mg pork) [8,9]. It is also a great source of vitamins: B3, B6, B12 (the highest content of B12: 8.7–11.9 mg/100 g, threefold more than beef) [10], and E. Its low Na level makes it recommendable for children, pregnant women, people with cardiovascular diseases, and elderly people [13,18,19].

One of the most popular small game species is the brown hare (*Lepus europaeus* Pallas) [20–30], sometimes reared in farms for the restocking of hunting and protected areas across Europe [20,21]. The potential of adding hare meat into the human diet is high, due to its sensory characteristics [22], low fat content, high unsaturated fatty acids [21,22], valuable proteins, mineral content, and vitamins [23,24], while its energetic value is similar to other meats [20,23]. Hare meat is classified as red meat, mainly in terms of its high Fe content [20,27], but its availability is restricted by hunting seasons. The hare in general, and wild rabbit in particular, consume a wide variety of plants and grains that qualitatively and nutritionally differ by season, which may cause large variation in the meat composition [28]. Very few data are available on the characterization of hare meat [20,22–30]. Only four articles approached the chemical quality of hare meat (*Lepus europaeus*) from hunting (from our knowledge), from Austria [24,25], Croatia, and Slovakia [26,27]; another three studies describe the quality of hare meat collected from farmed brown hare in Italy [20,30] and Poland [31].

The lack of data on the characterization of hare meat in comparison with rabbit (*Oryctolagus cuniculus*) meat led us to carry out this study. Due to its spectacular size, the Flemish Giant breed is the most farmed one in Romania. Its traits include: massive head; long ears (17–21 cm) with a rounded tip and worn in a "V" shape; and variable fur colouring, mostly agouti but also black, dark grey (kangaroo), brown, or chinchilla. Adults can weight up to 7.5 kg, and exceptionally above 12 kg. The aim of this study was to nutritionally and technologically compare the meat of farmed rabbits (*Oryctolagus cuniculus*—Flemish Giant breed) with the meat of hunted hares (*Lepus europaeus* Pallas).

2. Materials and Methods

2.1. Meat

Meat issued from 50 rabbits (25 males and 25 females), slaughtered at 11 months old, with average carcass weights of 10.9 kg and from 50 hares (23 males and 27 females), aged around 9 months, that had been shot during the regular hunting season (November to January) in Iasi County, Romania. Their carcasses weighted around 3.6 kg. Meat was sampled right after slaughter, from 3 muscular groups: *Longissimus dorsi* (LD), *Semimembranosus* (SM), and *Triceps brachii* (TB); they were chosen due to the expected different physical-chemical properties, as well as to cover the main anatomical regions of carcasses (dorsal torso or episoma—LD, hind leg—SM, foreleg—TB). Muscles from one half of each individual carcass were sampled to run physical-chemical tests, while the ones from the other half were used for technological assessments. Samples were minced per muscle group and homogenised prior to analysis. Afterwards, quantities as required by each method were used to run 20 analytical repetitions per trait.

2.2. The Nutritional Assessment of Hare and Rabbit Meat

2.2.1. Chemical Properties and Energy Value of Hare and Rabbit Meat

For the proximate composition analysis, the muscle samples were preliminarily finely ground and homogenized using an electric shredder. The water, protein, and lipid contents were assessed on the Omega Bruins Food-Check Near InfraRed (NIR) spectrophotometer (Bruins Instruments GmbH, Puchheim, Germany); the crude ash content was assessed by furnace muffle calcination in a Nabertherm B180 device (Nabertherm GmbH, Lilienthal, Germany) (550 °C for 24 h after a preliminary carbonization on Bunsen burner flame) [32,33]. The nitrogen-free extract (NFE) was calculated by difference, using the Equation (1).

$$\text{NFE (g/100 g)} = 100 - \text{Water} - \text{Ash} - \text{Proteins} - \text{Lipids} \quad (1)$$

The gross energy value was calculated via the Atwater Equation (2), which uses the caloric value of each organic matter compound in the analysed matrix (total proteins, lipids, nitrogen-free extract—NFE) [34].

$$\text{GE (kcal/100 g meat)} = \text{g proteins} \times 4.27 \text{ kcal} + \text{g lipids } 9.02 \text{ kcal} + \text{g NFE} \times 3.87 \text{ kcal} \quad (2)$$

2.2.2. Fatty Acid Content

The assessment of fatty acids was performed on the FOSS 6500 NIR spectrophotometer (FOSS co., Hillerod, Denmark). The samples (harvested immediately after slaughter, stored at −80 °C, thawed at 2–4 °C for 24 h, then chopped with a food processor) were placed in sterile Petri dishes, weighed, then lyophilized at −110 °C for 24 h, using the CoolSafe ScanVac freeze dryer (LaboGene co., Lillerod, Denmark), weighed again, then vacuumed and stored in a freezer at −80 °C until analysis. The following saturated fatty acids (SFA) were assessed: C14:0 (myristic acid), C15:0 (pentadecanoic acid), C16:0 (palmitic acid), C17:0 (heptadecanoic acid), and C18:0 (stearic acid). Among the monounsaturated fatty acids (MUFA, ω7 and ω9) these were analysed: 16:1 n-7 (palmitoleic acid, n-7 fatty acid), C18:1 n-7 (vaccenic acid cis isomer of oleic acid), and C18:1 n-9 (oleic acid). A total of nine polyunsaturated fatty acids (PUFA, ω3 and ω6) were also assessed: C18:2 n-6 (linoleic), C18:3 n-3 (linolenic/ALA), C20:2 n-6 (eicosadienoic), C20:3 n-6 (eicosatrienoic), C20:4 n-6 (arachidonic/AA), C20:5 n-3 (eicosapentaenoic/EPA), C22:4 n-6 (docosatetraenoic), C22:5 n-3 (docosapentaenoic/DPA), and C22:6 n-3 (docosahexaenoic/DHA).

2.2.3. Health Lipid Indices Calculation

Rabbit and hare meat *health lipid quality* was assessed by calculating certain sanogenic indices provided by literature (Equations (3)–(9)):

- The amounts of SFA, MUFA, PUFA (issued from analytical findings, summed up);
- The desirable fatty acids [35]

$$\text{(DFA) DFA} = 18{:}0 + \text{MUFA} + \text{PUFA} \quad (3)$$

- The essential fatty acids [35]

$$\text{(EFA) EFA} = \text{C18:2 n-6} + \text{C18:3 n-3} + \text{C20:4 n-6} \quad (4)$$

- The Polyunsaturation Index (PI) [35,36]

$$\text{PI} = \text{C18:2 n-6} + (\text{C18:3 n-3} \times 2) \quad (5)$$

- The Atherogenic Index (AI) [37,38],

$$\text{AI} = [(4 \times \text{C14:0}) + \text{C16:0} + \text{C18:0}]/\text{MUFA} + \text{PUFA n-6} + \text{PUFA n-3} \quad (6)$$

- The Thrombogenic Index (TI) [37,39],

$$TI = (14:0 + 16:0 + 18:0)/[(0.5 \times MUFA) + (0.5 \times n\text{-}6\ PUFA) + (3 \times n\text{-}3\ PUFA) + (n\text{-}3\ PUFA/n\text{-}6\ PUFA)] \quad (7)$$

- The ratio between the hypocholesterolemic and Hypercholesterolemic fatty acids (h/H) [38–40]:

$$h/H = (C18:1 + PUFA)/(C14:0 + C16:0) \quad (8)$$

- The Nutritive Value Index (NVI) [41,42],

$$NVI = (C\ 18:0 + C18:1)/C\ 16:0 \quad (9)$$

2.3. The Technological Assessment of Hare and Rabbit Meat

2.3.1. pH Value

The pH value of meat was measured at 24 and 48 h post-slaughter (on chilled samples, at 2–4 °C), using the digital pH meter HI99163 (Hanna Instruments Ltd., Leighton Buzzard, UK), with a penetration probe. Calibration of the pH meter was performed at 4.0 and 7.0 pH at ambient temperature.

2.3.2. Cooking Loss

Cooking loss (CL%) of meat was assessed gravimetrically. The samples were weighed with an analytical scale, then individually packed in thermo-resisting polyethylene bags, labelled, and subjected to heat treatment (80 °C for one hour in a water bath), then forcedly cooled in ice flakes for 30 min and rested at ambient temperature (21 °C) for another 30 min. Then, the samples were weighed again after removal, with paper filter, of the meat juice resulting from the heat treatment. Cooking loss was expressed as percentage.

2.3.3. Water-Holding Capacity

The water-holding capacity (WHC%) was carried out by a method of compression of the meat over filter paper between two plates [43]. Measurements were performed on the muscles stored at 2 °C, 24 h after slaughter. WHC was assessed on a sample of environ 3 g of meat, placed on previously desiccated and weighed filter-paper (7 cm diameter). The paper with the sample was placed between two glass plates and immediately loads of 2.25 kg were applied, for 5 min. After that, the damp paper filter was rapidly weighed after removal of the compressed meat. The percentage of WHC was calculated as a ratio per cent of weight of released water (damp filter paper weight–dry filter paper weight) to initial weight of meat.

2.4. Data Analysis

The results obtained were statistically processed through the main descriptors computation (Arithmetic mean, SD—standard deviation. V%—coefficient of variation) and analysis of variance, using the GraphPad Prism 9.4.1 software, running the unpaired two-tailed *t* test with Welch's correction, designed for one-to-one group comparisons assuming that the SDs are not equal (20 analytical results from each group of data).

3. Results

3.1. Proximate Composition and Gross Energy Content of Meat

Table 1 presents the proximate composition of hare and rabbit meat (g/100 g), while Table 2 displays the gross energy content (kcal/100 g).

Table 1. Proximate composition of hare and rabbit meat (g/100 g).

Proximate Compound	Muscles	Species	Mean	±SD	V%	*p* Value
Water (g/100 g)	SM	hare	75.15 [a]	±0.28	0.37	0.0213
		rabbit	74.85 [b]	±1.61	2.15	
	LD	hare	75.10	±0.41	0.55	0.1736
		rabbit	74.97	±1.24	1.65	
	TB	hare	74.76 [a]	±0.25	0.33	<0.001
		rabbit	74.18 [d]	±2.36	3.18	
Ash (g/100 g)	SM	hare	1.23	±0.01	0.81	0.4270
		rabbit	1.17	±0.01	0.85	
	LD	hare	1.24 [a]	±0.01	0.81	0.0238
		rabbit	1.21 [b]	±0.02	1.65	
	TB	hare	1.26 [a]	±0.02	1.59	0.0080
		rabbit	1.22 [c]	±0.01	0.82	
Proteins (g/100 g)	SM	hare	21.59	±0.09	0.42	0.7747
		rabbit	21.57	±0.41	1.90	
	LD	hare	21.53	±0.17	0.79	0.5918
		rabbit	21.62	±0.55	2.54	
	TB	hare	21.45	±0.08	0.37	0.4706
		rabbit	21.52	±0.13	0.60	
Lipids (g/100 g)	SM	hare	1.90 [a]	±0.13	6.84	0.0017
		rabbit	2.31 [c]	±0.21	9.09	
	LD	hare	1.64 [a]	±0.06	3.66	0.0019
		rabbit	1.93 [c]	±0.03	1.55	
	TB	hare	2.10 [a]	±0.16	7.62	0.0045
		rabbit	2.57 [c]	±0.12	4.67	
Nitrogen Free Extract (g/100 g)	SM	hare	0.13	±0.01	5.12	0.2617
		rabbit	0.10	±0.01	5.67	
	LD	hare	0.49 [a]	±0.02	3.81	0.0003
		rabbit	0.27 [d]	±0.01	4.61	
	TB	hare	0.43 [a]	±0.02	4.39	0.0019
		rabbit	0.51 [c]	±0.02	4.05	

LD—*Longissimus dorsi*; SM—*Semimembranosus*; TB—*Triceps brachii*; SD—standard deviation; V%– coefficient of variation; ANOVA: means signalled with non-identical superscripts, between species, within the same muscle group, differ significantly for: $p < 0.05$ [a vs. b]; $p < 0.01$ [a vs. c]; $p < 0.001$ [a vs. d].

Table 2. Gross energy content in hare and rabbit meat (kcal/100 g).

Muscles	Species	Mean	±SD	V%	*p* Value
SM	hare	109.83 [a]	±6.75	6.15	0.0009
	rabbit	113.33 [d]	±6.37	5.62	
LD	hare	108.62 [a]	±7.85	7.23	0.0014
	rabbit	110.77 [c]	±9.40	8.49	
TB	hare	112.20 [a]	±5.09	4.54	<0.001
	rabbit	117.05 [d]	±4.42	3.78	

LD—*Longissimus dorsi*; SM—*Semimembranosus*; TB—*Triceps brachii*; SD—standard deviation; V%– coefficient of variation; ANOVA: means signalled with non-identical superscripts, between species, within the same muscle group, differ significantly for: $p < 0.01$ [a vs. c]; $p < 0.001$ [a vs. d].

The highest water content was found in hare Semimebranosus (SM) (75.15 g/100 g), followed by Longissimus dorsi (LD) (75.10 g/100 g), while the lowest one occurred in rabbit Triceps brachii (TB) (71.185 g/100 g), varying inversely proportional with lipid content.

The highest protein content was found in rabbit LD samples (21.62 g/100 g meat), and close values, between 21.45 and 21.59 g proteins/100 g, occurred in other samples. No statistically significant differences occurred between species for the protein content, and the analytical homogeneity was high (V% varied between 0.37 and 2.54%).

Little difference was identified for ash content in hare samples, for all muscular groups (1.23–1.26 g/100 g); however, a higher than total mineral level was analysed in rabbit meat (1.17–1.22 g/100 g).

Rabbit meat was 17.7–22.4% higher in lipids (TB, 2.57 g/100 g; SM, 2.31 g/100 g; LD, 1.93 g/100 g) than hare (TB, 2.10 g/100 g; SM, 1.90 g/100 g; LD, 1.64 g/100 g) ($p < 0.01$).

Consequently, higher gross energy was found in rabbit meat (110.71 Kcal/100 g in LD to 117.05 Kcal/100 g in TB) compared to hare meat (108.62 Kcal/100 g in LD to 112.20 Kcal/100 g in TB) ($p < 0.01$ for LD and $p < 0.001$ for SM and TB) (Table 2).

3.2. Fatty Acid Content

Table 3 presents the fatty acid content in Semimembranosus, Longissimus dorsi, and Triceps brachii muscles sampled from hares and rabbits. The most frequently occurring fatty acid in SM was linoleic acid/C18:2 n-6 in hare (509.01 mg/100 g meat), followed by oleic acid/C18:1 n-9 in rabbit (484.12 mg/100 g meat). In rabbit, palmitic acid/C16:0 also occurred in a significant quantity (450.06 mg/100 g meat) alongside essential linoleic fatty acid/C18:2 n-6 (342.86 mg/100 g meat). Generally, in hare, the MUFA and PUFA were in higher quantities vs. rabbit, except for oleic acid (285.45 mg/100 g hare meat vs. 484.12 mg/100 g rabbit meat) and palmitoleic acid (1.05 mg/100 g hare meat vs. 80.13 mg/100 g meat).

Table 3. Fatty acid content (mg/100 g) in hare and rabbit meat.

	Fatty Acids	Species	*Semimembranosus* mm.				*Longissimus dorsi* mm.				*Triceps brachii* mm.			
			Mean	±SD	V%	*p* Value	Mean	±SD	V%	*p* Value	Mean	±SD	V%	*p* Value
SFA	C14:0	hare	5.55 ^{a}	±0.95	17.12	<0.001	1.91 ^{a}	±0.35	18.32	<0.001	0.72 ^{a}	±0.13	18.06	<0.001
		rabbit	45.03 ^{d}	±8.65	19.21		31.67 ^{d}	±3.20	10.10		66.02 ^{d}	±1.66	2.51	
	C15:0	hare	7.81 ^{a}	±1.09	13.96	0.0016	9.01 ^{a}	±1.52	16.87	0.0009	9.12 ^{a}	±1.26	13.82	0.0064
		rabbit	9.02 ^{c}	±2.37	26.27		6.06 ^{d}	±0.65	10.73		13.94 ^{c}	±3.23	23.17	
	C16:0	hare	302.47 ^{a}	±5.60	1.85	<0.001	329.07	±3.42	1.04	0.7453	297.04 ^{a}	±4.25	1.43	<0.001
		rabbit	450.06 ^{d}	±7.38	1.64		344.87	±4.31	1.25		687.94 ^{d}	±9.01	1.31	
	C17:0	hare	17.5 ^{a}	±2.70	15.43	0.0500	18.98 ^{a}	±1.14	6.01	<0.001	21.36 ^{a}	±1.59	7.44	0.0087
		rabbit	10.97 ^{b}	±2.42	22.06		6.93 ^{d}	±0.56	8.08		18.31 ^{c}	±4.24	23.16	
	C18:0	hare	101.92	±9.57	9.39	0.2637	112.16 ^{a}	±3.20	2.85	0.0038	114.94 ^{a}	±1.99	1.73	0.0028
		rabbit	119.88	±8.56	7.14		87.22 ^{c}	±5.92	6.79		177.07 ^{c}	±4.39	2.48	
MUFA	C16:1 n-7	hare	1.05 ^{a}	±0.04	3.81	<0.001	2.45 ^{a}	±0.16	6.53	<0.001	6.12 ^{a}	±0.31	5.07	<0.001
		rabbit	80.13 ^{d}	±3.10	3.87		51.01 ^{d}	±4.11	8.06		123.66 ^{d}	±3.90	3.15	
	C18:1 n-7	hare	24.78	±0.66	2.66	0.2415	27.01 ^{a}	±1.10	4.07	0.0009	27.94 ^{a}	±0.36	1.29	0.0025
		rabbit	28.11	±1.38	4.91		19.22 ^{d}	±1.63	8.48		45.88 ^{c}	±1.11	2.42	
	C18:1 n-9	hare	285.45 ^{a}	±4.02	1.41	0.0005	328.4	±4.56	1.39	0.6478	347.54 ^{a}	±6.88	1.98	0.0003
		rabbit	484.12 ^{d}	±5.03	1.04		309.17	±3.83	1.24		741.22 ^{d}	±9.78	1.32	
PUFA	C18:2 n-6	hare	509.01 ^{a}	±6.06	1.19	<0.001	559.55 ^{a}	±7.55	1.35	<0.001	639.05	±8.18	1.28	0.2204
		rabbit	342.86 ^{d}	±8.37	2.44		233.47 ^{d}	±4.18	1.79		577.12	±6.29	1.09	
	C18:3 n-3	hare	44.78 ^{a}	±4.01	8.95	0.0064	50.37 ^{a}	±9.46	18.78	<0.001	58.59	±1.07	1.83	0.9533
		rabbit	32.88 ^{c}	±2.43	7.39		20.11 ^{d}	±0.33	1.64		59.01	±1.91	3.24	
	C20:2 n-6	hare	8.95 ^{a}	±0.09	1.01	<0.001	10.34 ^{a}	±0.16	1.55	<0.001	10.41 ^{a}	±0.67	6.44	<0.001
		rabbit	3.98 ^{d}	±0.68	17.09		2.91 ^{d}	±0.18	6.19		8.29 ^{d}	±0.25	3.02	
	C20:3 n-6	hare	0.54 ^{a}	±0.01	1.85	<0.001	0.47 ^{a}	±0.04	8.51	<0.001	1.72 ^{a}	±0.39	22.67	<0.001
		rabbit	3.89 ^{d}	±0.27	6.94		4.16 ^{d}	±0.12	2.88		3.99 ^{d}	±0.50	12.53	
	C20:4 n-6	hare	60.91 ^{a}	±2.26	3.71	<0.001	64.21 ^{a}	±2.47	3.85	<0.001	56.24 ^{a}	±0.80	1.42	0.0206
		rabbit	53.01 ^{d}	±4.16	7.85		54.32 ^{d}	±1.18	2.17		51.78 ^{b}	±4.72	9.12	
	C20:5 n-3	hare	2.82 ^{a}	±0.39	13.83	<0.001	2.75 ^{a}	±0.04	1.45	<0.001	2.99 ^{a}	±0.69	23.08	<0.001
		rabbit	11.05 ^{d}	±1.17	10.59		10.04 ^{d}	±0.31	3.09		9.97 ^{d}	±1.86	18.66	
	C22:4 n-6	hare	16.77 ^{a}	±0.39	2.33	<0.001	16.9 ^{a}	±0.22	1.30	<0.001	16.5 ^{a}	±0.26	1.58	<0.001
		rabbit	15.07 ^{d}	±0.57	3.78		15.09 ^{d}	±0.14	0.93		15.44 ^{d}	±0.60	3.89	
	C22:5 n-3	hare	20.13 ^{a}	±1.21	6.01	<0.001	22.54 ^{a}	±1.51	6.70	<0.001	13.45 ^{a}	±1.66	12.34	<0.001
		rabbit	8.06 ^{d}	±1.13	14.02		9.26 ^{d}	±0.28	3.02		7.14 ^{d}	±1.06	14.85	
	C22:6 n-3	hare	38.53 ^{a}	±1.93	5.01	<0.001	42.84 ^{a}	±0.82	1.91	<0.001	27.38 ^{a}	±3.01	10.99	0.0004
		rabbit	22.89 ^{d}	±2.68	11.71		24.44 ^{d}	±0.68	2.78		21.89 ^{d}	±2.82	12.88	

V%—coefficient of variation; ANOVA: means signalled with non-identical superscripts, between species, within the same muscle group, differ significantly for: $p < 0.05$ $^{a\ vs.\ b}$; $p < 0.01$ $^{a\ vs.\ c}$; $p < 0.001$ $^{a\ vs.\ d}$.

In LD muscles, the highest content of fatty acids occurred in hare, and linoleic acid (559.55 mg/100 g meat) was more than double compared to rabbit (233.47 mg/100 g meat); for hare in general, the LD PUFA existed in higher amounts.

In TB samples, oleic acid was the most commonly occurring in rabbit (741.22 mg/100 g meat vs. 347.54 mg/100 g in hare) followed by linolenic acid in hare (639.05 mg/100 g meat vs. 577.12 mg/100 g meat in rabbit) and by C16:0 in rabbit (687.94 mg/100 g meat vs 297.04 mg/100 g meat for hare).

In general, SFAs were more present in rabbit than in hare, especially for C16:0 (687.94 vs. 297.04 mg/100 g in TB, 450.06 vs. 302.47 mg/100 g in SM, and 344.87 vs. 329.07 mg/100 g in LD). PUFA occurred at higher rates in hare; linoleic acid reached 639.05 mg/100 g in TB, 559.55 mg/100 g in LD, and 509.01 mg/100 g in SM. For MUFA, the highest values were found for oleic acid in rabbit (741.22 vs. 347.54 mg/100 g in TB; 484.12 vs. 285.45 mg/100 g in SM). In LD muscles, the oleic acid content was higher in hare, although it was close to the amounts in rabbit (328.40 vs. 309.17 mg/100 g). Palmitoleic acid (16:1 n-7) was higher in rabbit (51.01 mg/100 g).

3.3. Health Lipid Indices for Hare and Rabbit Meat

The total fatty acids and health lipid indices for hare and rabbit meat are presented in Table 4. The EFA value in hare was 680.90 mg/100 g meat, and in rabbit it was 474.85 mg/100 g meat. In hare, the %EFA for SM was 42.45%, in LD it was 42.16%, and in TB it was 45.66. In rabbit, the %EFA was 24.91% for SM, in LD it was 25.03%, and in TB it was 26.17%. Overall, the meat was 43.42% EFA in hare and 25.37% EFA in rabbit.

Table 4. Total fatty acids and health lipid indices for hare and rabbit meat (mg/100 g meat).

Health Lipid Indices	SM	LD	TB	Average/3 Carcass Areas
Σ SFA hare	435.25	471.13	443.18	449.85
Σ SFA rabbit	634.96	476.75	963.28	691.66
Σ MUFA hare	310.28	357.86	381.60	349.91
Σ MUFA rabbit	592.36	379.4	910.76	627.51
Total PUFA hare	702.44	769.97	826.33	766.25
Total PUFA rabbit	493.69	373.80	754.63	540.71
Σ PUFA n-6 hare	596.18	651.47	723.92	657.19
Σ PUFA n-6 rabbit	418.81	309.95	656.62	461.79
Σ PUFA n-3 hare	106.26	118.50	102.41	109.06
Σ PUFA n-3 rabbit	74.88	63.85	98.01	78.91
EFA hare	614.70	674.13	753.88	680.90
EFA rabbit	428.75	307.90	687.91	474.85
DFA hare	1114.64	1239.99	1322.87	1225.83
DFA rabbit	1205.93	840.42	1842.46	1296.27
Σ Total fatty acids hare	1447.97	1598.96	1651.11	1566.01
Σ Total fatty acids rabbit	1721.01	1229.95	2628.67	1859.88
% EFA hare	42.45	42.16	45.66	43.42
% EFA rabbit	24.91	25.03	26.17	25.37
% DFA hare	76.98	77.55	80.12	78.22
% DFA rabbit	70.08	68.33	70.09	69.50
Σ n6/Σn3 hare	5.61	5.50	7.07	6.06
Σ n6/Σn3 rabbit	5.59	4.85	6.70	5.71
Σ PUFA/ΣSFA hare	1.61	1.63	1.86	1.70
Σ PUFA/ΣSFA rabbit	0.778	0.784	0.783	0.78
PI hare	5.99	6.60	7.56	6.72
PI rabbit	4.09	2.74	6.95	4.59
AI hare	0.73	0.78	0.83	0.78
AI rabbit	0.68	0.50	1.02	0.73
TI hare	0.62	0.68	0.67	0.66

Table 4. *Cont.*

Health Lipid Indices	SM	LD	TB	Average/3 Carcass Areas
TI rabbit	0.37	0.32	0.49	0.39
h/H hare	3.29	3.40	4.04	3.58
h/H rabbit	2.03	1.86	2.04	1.98
NVI hare	1.36	1.42	1.65	1.48
NVI rabbit	1.41	1.21	1.40	1.34

LD—*Longissimus dorsi*; SM—*Semimembranosus*; TB—*Triceps brachii*; SFA = Saturated fatty acids; MUFA = monounsaturated fatty acids; PUFA = polyunsaturated fatty acids; EFA = essential fatty acids; %EFA = EFA × 100/Σ Total fatty acids; DFA = desirable fatty acids; %DFA = DFA × 100/Σ total fatty acids; PI = Polyunsaturation Index; AI = Atherogenic Index; TI = Thrombogenic Index; h/H = Ratio between the hypocholesterolemic and hypercholesterolemic fatty acids; NVI = Nutritive Value Index.

The desirable fatty acids (DFA%) ranged from 68.33% in rabbit LD muscles (the lowest value) to 80.12% in hare TB muscles (the highest value). Higher values were observed for all hare samples.

The Polyunsaturation Index was 5.99 in hare SM muscles, 6.60 in LD, and 7.56 in TB (Table 4). In rabbit, PI reached 4.09 in SM, 2.74 in LD, and 6.95 in TB.

The values from the Atherogenic Index in hare varied from 0.73 in SM to 0.83 in TB; in rabbit, the variability was higher, within the AI limits of 0.68 to 1.02.

The Thrombogenic Index in hare meat was relatively similar for the three muscle groups (0.62 for SM, 0.68 for LD, and 0.67 for TB) and much higher compared to rabbit samples (0.37 in SM, 0.49 in TB, and 0.32 in LD).

Higher values were observed in hare meat for the h/H index (3.29 in SM, 3.40 in LD, and 4.04 in TB) compared to rabbit (2.03 in SM, 1.86 in LD, and 2.04 in TB).

The Nutritional Value Index in hare samples varied between 1.36 in SM and 1.65 in TB, while in rabbit it ranged from 1.21 in LD to 1.41 in SM.

Overall, for all three muscle groups, each species' meat can be characterized thus: the PI was 6.72 in hare and 4.59 in rabbits; the AI reached 0.78 in hare and 0.73 in rabbit; the TI was calculated at 0.66 in hare and at 0.39 in rabbit; and the h/H index was 3.57 in hare and 1.97 in rabbit; while the NVI in hare was 1.48, and in rabbit it reached 1.34, indicating a better sanogenic value for hare and rabbit than the meat issued from other species of mammals.

3.4. The Technological Assessment of Hare and Rabbit Meat

3.4.1. pH Value

The pH24 and pH48 measured values of hare and rabbit meat are presented in Table 5.

Table 5. The pH24 and pH48 for hare and rabbit meat.

Muscles	Period	Species	Mean	±SD	V%	*p* Values
Longissimus dorsi	24 h	hare	5.631 ^{a}	±0.10	1.78	0.0008
		rabbit	5.724 ^{d}	±0.12	2.10	
	48 h	hare	5.665 ^{a}	±0.11	1.94	0.0003
		rabbit	5.762 ^{d}	±0.14	2.43	
Semimembranosus	24 h	hare	5.685 ^{a}	±0.08	1.41	0.0066
		rabbit	5.796 ^{c}	±0.12	2.07	
	48 h	hare	5.769 ^{a}	±0.11	1.91	0.0039
		rabbit	5.818 ^{c}	±0.13	2.23	
Triceps brachii	24 h	hare	6.033	±0.08	1.33	0.2529
		rabbit	6.002	±0.15	2.50	
	48 h	hare	6.138 ^{a}	±0.08	1.30	0.0034
		rabbit	6.087 ^{c}	±0.08	1.31	

SD—standard deviation; V%—coefficient of variation; ANOVA: means signalled with non-identical superscripts, between species, within the same muscle group, differ significantly for: $p < 0.01$ $^{a\ vs.\ c}$; $p < 0.001$ $^{a\ vs.\ d}$.

3.4.2. Cooking Loss

The cooking loss (%) values of hare and rabbit meat samples are presented in Table 6.

Table 6. Cooking loss (%) for rabbit and hare meat.

Muscles	Species	Mean	±SD	V%	*p* Values
Longissimus dorsi	rabbit	31.41 [a]	±2.75	8.76	<0.001
	hare	27.52 [d]	±1.31	4.76	
Semimembranosus	rabbit	36.2 [a]	±2.25	6.22	<0.001
	hare	31.04 [d]	±1.39	4.48	
Triceps brachii	rabbit	30.23 [a]	±2.23	7.38	<0.001
	hare	28.64 [d]	±1.24	4.33	

SD—standard deviation; V%—coefficient of variation; ANOVA: means signalled with non-identical superscripts, between species, within the same muscle group, differ significantly for: $p < 0.001$ [a vs. d].

3.4.3. Water-Holding Capacity (%)

The water-holding capacity (%) values of hare and rabbit meat are presented in Table 7.

Table 7. Water-holding capacity (%) of rabbit and hare meat.

Muscles	Species	Mean	±SD	V%	*p* Values
Longissimus dorsi	rabbit	7.79 [a]	±0.30	3.85	<0.001
	hare	14.58 [d]	±0.60	4.12	
Semimembranosus	rabbit	12.17 [a]	±0.80	6.57	<0.001
	hare	18.23 [d]	±1.43	7.84	
Triceps brachii	rabbit	8.77 [a]	±0.58	6.61	<0.001
	hare	15.73 [d]	±1.26	8.01	

SD—standard deviation; V%—coefficient of variation; ANOVA: means signalled with non-identical superscripts, between species, within the same muscle group, differ significantly for: $p < 0.001$ [a vs. d].

The lowest values of WHC% were found in rabbit LD (7.79%), followed by TB (8.77%) and SM (12.17%). For hare, the lowest WHC% was found in LD (14.58%), followed by TB (15.73%) and SM samples (18.23%).

4. Discussion

4.1. The Nutritional Assessment of Hare and Rabbit Meat

4.1.1. Chemical Properties and Energy Value of Hare and Rabbit Meat

Significant differences between species were found for water content in SM samples (+0.4% in hare, $p < 0.05$) and in TB, as well (+0.8% in hare, $p < 0.01$) (Table 1). The water content for hare meat was close to that measured by other authors [26] (75.34%) and was in line with wider findings [30] (73.3–75.5 in hind leg and LD muscles); meat water found in our study was higher than reported values in other articles [20] (73.3%), [31] (73% in foreleg, 74% in hind leg, and 73.4% in LD muscles) and [27] (72.83%).

Differences between species for ash were significant in LD muscles ($p < 0.05$) and TB muscles ($p < 0.01$) (Table 1). The measured ash in hare meat was lower than that reported in certain articles [31] but aligned with other findings, 1.16% ash [23]. Vizzarri et al. [20] found 1.06% ash in LD muscles, and Trocino et al. [30] found 1.28–1.42% ash in subadult and adult hares. The lipid content in hare meat was close to that reported by other authors [20,23,27,30,31] and slightly lower than that in other studies [31].

Slightly lower protein levels occurred in our study, in comparison with levels assessed by other authors in Croatia, Italy, and Poland [26,30,31]. The quantity of lipids was slightly higher in our study, while other studies found higher lipid content than in ours [31]. In the meat of hare that had been shot, other authors described the proximate composition as follows: water 75.32%, protein 23.08%, fat 1.09%, and ash 1.16% [26].

The interspecific differences related to calorie content were significant for LD samples ($p < 0.05$) and for SM and TB muscles ($p < 0.01$) where high lipid content was measured (Table 2).

In farmed hare meat, a study found levels of 73.3% water, 22% protein, 2.1% lipids, and 1.35% ash in the hind legs and, respectively, 75.5% water, 23% protein, 1.0% lipids, and 1.44% ash in LD [30].

Protein levels in rabbit varies in accordance with the carcass part, ranging between 18.6 g/100 g in the forelegs and 22.4 g/100 g in LD muscles [41–44].

The assessed fat content was relatively close to the results found in the literature [42–50]. Pla M. et al., 2008, [45] found an average of 1.2 g/100 g lipids in LD muscle and 3.03 g/100 g in the hind legs. Similar values of ash content were found in average sized rabbit breeds in Italy [30].

The water values were placed within the limits obtained by other authors, from 69.7 g/100 g in foreleg and hind leg muscles to 75.3 g/100 g in LD muscles [42,46–50].

Rabbit and hare meat provides moderate energy value, due to its high protein and low fat content.

4.1.2. Fatty Acid Content

Regarding the fatty acid content (Table 3), the differences between species were significant for SM muscles ($p < 0.05$) but not for C18:0 (SFA) and C18:1 n-7 (MUFA), where differences of lower amplitude were observed ($p > 0.05$).

In LD muscles, the differences between species were statistically significant, with the exception of C18:1 n-9 (MUFA) fatty acids.

In TB muscles, the differences between species were statistically significant, but not for C18:2 n-6 and C18:3 n-3 (PUFA) fatty acids.

4.1.3. Health Lipid Indices

The fatty acid profile and health lipid indices, according to our findings, are presented in Table 4. For humans, EFAs are very important because they cannot be synthesized in the body and humans require EFA uptake through food. Previous studies reported that EFAs and DFAs have an important role in biological activity. For example, the proportion of DFAs in the breasts and thighs of three breeds of chickens and broilers [51] ranged from 65.15% to 69.83% and from 70.23% to 72.25%, respectively. Other authors [52] suggested that the DFAs could be useful in describing the potential health effects of different types of lipids [35].

In the present study, DFAs were 78.22% in hare and 69.50% in rabbit.

The PUFA:SFA ratio for hare meat reached 1.61 in SM muscles, 1.63 in LD muscles, and 1.86 in TB muscles, with an average of 1.70. Higher values were revealed in our research than those reported in other studies [31] (1.17 in LD, 1.20 in the hind leg, and 1.40 in the foreleg) and was close to values reported in other articles [30] (0.83 for hind leg of youth and 1.70 for adult). The high PUFA/SFA ratio in hare and rabbit meat is favourable for human health. The α-linolenic acid (C18:3 9 c12 c15 c) and PUFAs C20:5 EPA, C22:5 DPA, and C22:6 DHA received the most attention due to their importance for human health [53]; they are effective in reducing triacylglycerol in blood and preventing cardiovascular diseases. EPA and DHA also reduce inflammation and play a role in decreasing the incidence of childhood allergic diseases. In addition, EPA and DHA have biological activities that might influence tumoral cell proliferation and viability; DHA can promote tumours cell apoptosis, possibly by inducing oxidative stress [54,55]. The European Food Safety Authority recommends an intake of 250 mg of EPA plus DHA per day as sufficient for preventing morbidity in humans with no pathology installed [56].

The n-6/n-3 ratio represents an important lipid quality index and can help to prevent or treat many diseases. Eating habits have dramatically changed throughout the years, and Western diets have become poor in n-3 PUFAs and rich in n-6 PUFAs, resulting in an unhealthy n-6: n-3 ratio of 17 to 20:1, which seems much higher than the recommended

ratio of 2.5 to 8:1 [57–59]. A ratio of 10:1 was recommended for n-6/n-3 to avoid the risk of cardiovascular disease, obesity, and chronic diseases [57].

The values of the TI and h/H nutritional indexes were similar to those computed for the muscle of the loin (*Longissimus lumborum*) from rabbits fed a pelleted diet supplemented with fresh alfalfa and thyme [60,61]. There was a higher n-3 family PUFA content in rabbit meat derived from a grass-based diet [61–63].

The atherogenic index (AI) and thrombogenic index (TI) are important tools indicating a potential for stimulating platelets' aggregation and estimating the likelihood of food to favour the onset of coronary heart disease. They also provide an indication about the nutritional quality of lipids, where low values suggest healthier food with better nutritional quality of fatty acids and, subsequently, a greater potential for preventing coronary diseases [41].

Fatty acid content of food has become increasingly important, and fatty acids are involved in health issues in humans. The nutritional value of fats is proven by the content and structure of fatty acids, as well as by the ratio between them [12,13,64,65]. The content and profile of the fatty acids in meat is dependent on species, breed, gender, anatomical part, muscle group, and rearing system conditions (especially animal feeding).

Palmitic acid (C16:0) and stearic acid (C18:0) were the major saturated fatty acids from the samples analysed; these were also observed by other authors in dry-cured pork and rabbit-meat burgers [4,5,66,67].

In rabbit meat, palmitoleic acid was clearly higher than in the hare meat in all three muscular groups, probably because adipocytes in hares are scarce, knowing the liveweight of hares was smaller by more than 50% (3.6 kg in hare compared with 10.9 in rabbit). Palmitoleic acid (produced and released by adipocytes) has been shown to enhance whole-body glucose disposal, to attenuate hepatic steatosis (protecting pancreatic beta-cells from palmitic acid-induced death), to improve the circulating lipid profile (in rodents and humans), and to act as regulator of physiological cardiac hypertrophy [68,69].

Oleic acid (18:1 n-9 MUFA), the most commonly occurring fatty acid in the samples, can be nutritionally beneficial: moderate and constant intake of oleic acid can reduce hypercholesterolemia [70] and insulin levels in the body, in addition to preventing the occurrence of pancreatic cancer [71] and assisting in the control of obesity [72]. The meat samples from rabbits presented a considerable amount of palmitoleic acid C16:1 n-7 (especially in TB muscles, 123.66 mg/100 g) that provides nutritional benefits along with a lower occurrence of atherosclerosis [73], type II diabetes [74], and obesity [16,75].

Concerns about the quality of rabbit meat have been observable in the literature for more than 25 years, coming in anticipation of consumers' wishes, who, unfortunately, do not eat a lot of rabbit meat anymore [76,77].

The relationship between the dietary fatty acid (FA) profile and rabbit meat FA profile has been widely and thoroughly evaluated [42,78,79] throughout the past 40 years. For non-ruminant animals, the FA profile of meat partially reflects their diet composition, and many studies aimed to incorporate the n-3 PUFA in rabbit diets, to improve quality of tissular lipids. Rabbit meat is a good source of unsaturated fatty acids (UFA) and linoleic acid (18:2 n-6; LA); the manipulation of diet is very effective in increasing n-3 PUFA, thus obtaining functional meat [10].

There are authors [80] claiming that cardiovascular disease (CVD) accounts for 45% of deaths in Europe and for 32% of deaths worldwide [81,82], whilst atherosclerosis seems to be the most important cause of cardiovascular mortality in developed countries [83]. A diet rich in saturated fatty acids (SFAs) and cholesterol along with a low intake of fibre and PUFAs is associated with atherosclerosis; therefore, a diet rich in PUFAs and low in SFAs [84] is recommended. The impact of fatty acids on atherosclerosis still remains controversial. Recent studies indicated no correlation between the consumption of SFAs and the overall mortality and also showed that some diets containing SFAs, such as dairy products, may be associated with a reduction in CVD risk [85,86].

The positive influence of PUFAs on CVD risk mitigation appear to be obvious; concerning the impact of the n-6/n-3 ratio, nutritionists recommend consuming large amounts of n-3 and give less importance to n-6; however, certain studies involving humans stated the important roles of both n-3 and n-6 fatty acids, with no correlation between the n-6/n-3 ratio, obesity, and CVD risk [57,80,86].

Due to the high PUFA level in hare meat, the AI was lower but close to rabbit meat (on average, AI was 0.78 vs 0.73), which should be attractive to consumers because of the role of PUFAs in decreasing CVD; the TI tended to be higher in hare meat (on average 0.66) than in rabbit meat (0.39 for all muscle groups). The low values of both the AI and TI may be features specific to the species.

Usually, game meat comes from hunting, but hare farmed for restocking purposes can be used for meat production due to their slaughter results (high proportion of meat in hind legs and loins) and high nutritional value of meat with especially high PUFA and EFA proportions [20,30]. This fact would offer more commercial opportunities, in addition to restocking, to hare farmers [30]. Under controlled conditions, it might be an alternative method for producing a high-quality meat that could protect consumers' health.

Indices related to human health calculated for rabbit meat are in line with other studies [77].

4.2. The Technological Assessment of Hare and Rabbit Meat

4.2.1. pH Value

The pH values were higher in TB muscles (Table 5) for both species (above 6.00 pH units). The pH of meat is mainly influenced by the metabolic specialisation of muscle (glycolytic and oxidative fibres). TB muscles have a higher oxidative metabolism, lower glycolytic potential, and higher pH value than LD and SM muscles. No significant differences occurred between species in TB muscles for pH24, and they became significant for pH48 ($p < 0.01$). In LD muscles, the species differed significantly ($p < 0.001$), as did SM muscles ($p < 0.001$) for both assessments (pH24 and pH48). The results are in line with other studies for rabbit meat issued from medium-sized breeds [87,88].

4.2.2. Cooking Loss

The highest values for cooking loss (CL%) occurred in rabbit SM muscles (Table 6). In hare, they were generally low compared to those measured in the rabbit sample, probably due to the much larger size of the muscle fibres in the latter, compared to smaller thickness of the hare muscle fibres [89,90]. Significant differences ($p < 0.001$) occurred between species for all three muscular groups, but they were in line with other studies for hare [30] and rabbit [41].

4.2.3. Water-Holding Capacity

WHC% was higher in hare than in rabbit, for all muscles groups studied ($p < 0.001$) (Table 7). In SM muscle, a higher average value of WHC (12.17% for rabbit vs 18.23% for hare) is probably due to the smaller diameter of myocites and also to higher water content. The values obtained in our study are lower than those reported by other authors for rabbit [87] in *L. lumborum* muscles (14.5–15.4%) and in *L. dorsi* muscles (16.25% and 32%) [91,92], with differences generated by breeds (medium size/hybrid vs rabbit breed) and age at slaughter (42 days, 64 days-old, and 240 days vs. 330 days-old).

Further research is needed to elucidate the role of feeding, habitat, and locomotion on meat quality of hare and rabbit. The differences found in this study could be influenced by age (rabbits were examined at older age—11 months and hares at younger age—9 months). The rabbits had a limited range of motion, and the hares moved across larger areas. Thus, in other studies [93], the percentage of fat deposits was highest in caged rabbits (compared to a bigger proportion of hind parts in rabbits reared in large pens). Water-holding capacity and lipid content were not affected by the housing systems.

For hare, the effects of diet and gender did not produce important differences in productive performances and on the quantitative and qualitative parameters of their meat. Thus, the hare reared in cages had a better performance, with fleshier carcasses and higher accumulations of fat. Rearing of hare in pens favours the production of meat with better dietary characteristics (advisable for diets oriented for the prevention of CVD) [94].

Due to its low contents of fat and cholesterol as well as to the high proportion of PUFA, rabbit meat is considered a "healthy" meat [95–97]. However, its consumption is sometimes rejected because its cooking is considered time-consuming and requires culinary skills. In order to promote the consumption of rabbit meat, the processing companies have been trying to develop ready-to-cook and ready-to-eat products. A possible way to improve rabbit meat utilization for convenience foods preparation could be realised by freezing it when the market price is lower (during summer) and using it as raw matter in preparing further processed products (minced meat, hamburgers, sausages, charcuterie) when the price becomes higher again [41,98].

The meat of goat, cattle, buffaloes, fowl, and sheep is insufficient to satisfy the growing demand for animal protein, and it has become necessary to explore alternatives animal protein sources to reduce this deficit. The rabbit, a small animal (that does not produce CO_2 in high quantities), can be considered an alternative sustainable source of protein, comparable to chicken from a nutritional point of view, and its nutritional and dietary qualities should be promoted through public campaigns for benefits regarding consumer health. Hare meat is a full-value meat, easily digestible with typical aroma for the given species, and it has finer muscle fibres than the meat of other mammals. Venison ranks among the richest proteinaceous meat, along with fish, and thanks to its relatively low fat content, rabbit has higher nutritional and dietetic qualities than other farmed species [20].

5. Conclusions

Gross energy content was higher in all muscles in rabbit versus hare meat, especially in *Triceps brachii* muscles from rabbit compared to hare, due to more lipid accumulation.

On the technological meat quality, pH value was higher in *Triceps brachii* muscles from both species, while water-holding capacity was better in hare samples, and cooking loss was better in rabbit samples. As follow-up, the connective matrix of skeletal muscles should be investigated, regarding its composition and proportion in meat, to explain the differences between species, in which now favours hare muscles.

For all muscle groups, the mean value of AI was 0.78 in hare and 0.73 in rabbit; the TI had a mean of 0.66 in hare and of 0.39 in rabbit; and the h/H index was 3.57 in hare and 1.97 in rabbit. The NVI reached 1.48 in hare and 1.34 in rabbit. Overall, hare meat was found as more dietetic (lower fat, lower gross energy, better sanogenic lipidic profile indices) than rabbit meat, whose fatty acid profile is influenced by farm feeding.

From a nutritional point of view, the consumption of both hare and rabbit meat can positively contribute to improvements in human health, because of its favourable health indices and high nutritional value.

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