chemistry proceedings

MDPI

Proceeding Paper

Comparative Study of the Profile of Fatty Acids Determined for Roosters and Capons Belonging to Transylvanian Naked Neck Breed Iași, Romania †

Cipriana Maria Cuciureanu *, Răzvan Radu-Rusu and Marius Giorgi Usturoi

Faculty of Animal Resources and Food Engineering, University of Life Sciences "Ion Ionescu de la Brad", 700490 Iași, Romania; radurazvan@uaiasi.ro (R.R.-R.); umg@uaiasi.ro (M.G.U.)

* Correspondence: cipriana.cuciureanu@yahoo.com

† Presented at the 1st International Online Conference on Agriculture—Advances in Agricultural Science and Technology, 10–25 February 2022; Available online: https://iocag2022.sciforum.net/.

Abstract: The research aimed to evaluate the influence exerted by the removal of the testicles (orchidectomy) in roosters on the fatty acids profile. In this regard, two batches of roosters belonging to the Transylvanian Naked Neck breed were formed; one batch was experimental (Lexp), composed of 20 birds castrated at the age of 7 weeks, and one batch was control (Lm), composed of 10 uncastrated roosters. The birds of the two groups were raised under identical conditions and received the same type of compound feed; their slaughter was performed at the age of 20 weeks. The results obtained after reporting the values of saturated fatty acids to unsaturated fatty acids recorded the highest value of 0.47 in the case of the muscles from the upper thighs of roosters (Lm). Regarding the ratio between polyunsaturated fatty acids and monounsaturated fatty acids, the highest value of 1.12 was calculated for the muscles of the upper thighs from capons (Lexp). Regarding the Ω3/Ω6 ratio, the highest value of 17.81 was calculated for the muscles of the upper thighs from the capons, while at the opposite pole was the result for the pectoral muscles of roosters from Lm, with the value of 12.48. We recommend continuing research in this direction.

Keywords: capons; Transylvanian Naked Neck; fatty acids; saturated fatty acids; unsaturated fatty acids; polyunsaturated fatty acids; monounsaturated fatty acids; Ω3/Ω6 ratio

Citation: Cuciureanu, C.M.; Radu-Rusu, R.; Usturoi, M.G. Comparative Study of the Profile of Fatty Acids Determined for Roosters and Capons Belonging to Transylvanian Naked Neck Breed Iași, Romania. *Chem. Proc.* **2022**, *10*, 80. https://doi.org/10.3390/IOCAG2022-12212

Academic Editor: Bin Gao

Published: 10 February 2022

1. Introduction

Capon manufacturing is an ancient practice that has endured till now, with records reaching back over 2000 years [1]. Capon production is done on a limited scale with just a small market niche, but it has a lot of room for expansion because capon meat has special sensory properties that customers like [2]. Caponization consists of orchidectomy, leading to androgen deficiency and consequent phenotypic and behavioral changes, such as reduced development of comb and wattles, loss of aggressiveness, and reduced activity [3]. As a result, the energy ordinarily invested in fighting and territorial domination is freed up, allowing for increased development and fat deposition [4].

Consumers are currently demanding more variety and high-quality attributes in various poultry meat products. The capon (a male rooster having his testes surgically removed before sexual maturation) is one of these products [5]. The removal of the testicles alters the metabolism of the animal, influencing growth, behavior, tissue composition, chemical composition, and meat organoleptic quality [6]. The principal metabolic effect of caponization is the increase of fat content: abdominal, subcutaneous, and intramuscular. This effect has improved meat quality, enhancing the flavor, texture, and meat juiciness and making it more appreciated by consumers than rooster meat of the same age [7]. A decrease in saturated fatty acids (SFA) and an increase in unsaturated fatty acids (UFA) content in capon meat would be beneficial for the human diet [8].

The objective of this study was to compare the content in fatty acids in the anatomical portions of interest to the capons and roosters of the Transylvanian Naked Neck breed.

2. Methods

Thirty roosters from the Transylvanian Naked Neck breed were used as biological material, separated into two experience batches (experimental group: Lexp, consisting of 20 heads; control batch: Lm, consisting of 10 heads).

The males from Lexp were surgically castrated at the age of seven weeks, which was the only variation between the two groups. Roosters were castrated using a bilateral laparotomy technique in the final intercostal space, puncturing the air sacs, bringing the testicles to the fore with a special forceps, and then conducting orchidectomy by limitless torsion. A continuous thread was used to stitch the wound. All of the birds were slain when they reached the age of 20 weeks.

The applied method consisted of extracting the fat; the concentration of fatty acids was expressed in grams FAME/100 g FAME (methyl esters of fatty acids). The working method applied was in accordance with:

1. Preparation of methyl esters SR CEN ISO/TS 17764-1: 2008;
2. Gas chromatographic method SR CEN ISO/TS 17764-2: 2008.

The principle of the method was: transformation into fatty acids of methyl esters from the fat sample under analysis, followed by separation of the components on the capillary chromatographic column and identification by comparison with standard chromatograms and quantitative determination of fatty acids (g FAME/100 g total FAME).

3. Results and Discussion

The data obtained on saturated fatty acids origin from the musculature of the chest revealed for both batches (Lm, Lexp) that the main constituent is palmitic acid C16:0; thus, for Lm the average was 21.20 $\pm$ 0.003 g/100 g, with variation of 21.19 g/100 g (minimum) and 21.21 g/100 g (maximum), while for the Lexp the average was 20.66 $\pm$ 0.005 g/100 g, with variation of 20.64 g/100 g (minimum) and 20.67 g/100 g (maximum). The constituent with the lowest average for both batches was represented by caprylic acid C8:0, with a value of 0 g/100 g. The total saturated fatty acids resulting from the chest muscles was 30.88 g/100 g for roosters from Lm, and 31.18 g/100 g for capons (Table 1). In the case of monounsaturated fatty acids—dominant in both cases—was oleic cis acid C18:1n9, with an average for Lm of 31.44 $\pm$ 0.004 g/100 g, the minimum being 31.43 g/100 g and the maximum 31.45 g/100 g, while for the Lexp the average was 29.80 $\pm$ 0.004 g/100 g. For the Lm the acid with the lowest average was erucic acid C22:1n9, 0.060 g/100 g. The lowest result recorded by Lexp was 0.069 g/100 g in the case of myristoleic acid C14:1. The total of monounsaturated fatty acids was 36.37 g/100 g for Lm and 34.30 g/100 g for Lexp. Results on polyunsaturated fatty acids indicated for roosters (Lm) a total value of 32.52 g/100 g, the lowest value was recorded by eicosadienoic acid C22:2n6, with an average of 0.05 g/100 g. On the opposite pole was linoleic acid C18: 2n6, with an average of 26.25 $\pm$ 0.003 g/100 g. In the case of the experimental group, the content in polyunsaturated fatty acids registered a value of 26.83 $\pm$ 0.003 g/100 g, with variation of 26.82 g/100 g (minimum) and 26.84 g/100 g (maximum). The total of polyunsaturated fatty acids was 32.52 g/100 g for Lm and 34.14 g/100 g for Lexp. Regarding the ratio between fatty acids Ω_6 and Ω_3 in the chest, the values calculated were 20.86 for Lm and 12.48 for Lexp. The SFA/UFA ratio was 0.45 for the control batch and 0.46 for the experimental batch. The PUFA /MUFA ratio had values of 0.89 (Lm) and 1.0 (Lexp) (Table 1).

Table 1. Chest fatty acids.

Specification	Chest							
	Lm				Lexp			
	Statistical Estimators							
Fatty Acids	$X \pm s_x$ (g AG/100 g)	V%	Min. (g AG/100 g)	Max. (g AG/100 g)	$X \pm s_x$ (g AG/100 g)	V%	Min. (g AG/100 g)	Max. (g AG/100 g)
C8:0	0	0	0	0	0	0	0	0
C10:0	0.03 ± 0	2.36	0.029	0.031	0.039 ± 0	2.13	0.038	0.040
C12:0	0.06 ± 0	1.18	0.059	0.061	0.069 ± 0	1.21	0.068	0.070
C14:0	0.47 ± 0.003	1.50	0.460	0.480	0.492 ± 0.006	2.650	0.470	0.500
C15:0	0.10 ± 0.004	8.20	0.090	0.110	0.11 ± 0.003	6.428	0.100	0.120
C16:0	21.20 ± 0.003	0.03	21.190	21.210	20.66 ± 0.005	0.059	20.640	20.670
C17:0	0.16 ± 0.004	5.16	0.150	0.170	0.282 ± 0.004	2.967	0.270	0.290
C18:0	8.74 ± 0.003	0.08	8.730	8.750	9.23 ± 0.003	0.077	9.220	9.240
C24:0	0.11 ± 0.003	6.43	0.100	0.120	0.29 ± 0.003	2.438	0.280	0.300
SFA	30.88				31.18			
C14:1	0.08 ± 0	1.05	0.079	0.081	0.069 ± 0	1.209	0.068	0.070
C15:1	0.80 ± 0.004	1.05	0.790	0.810	0.77 ± 0.003	0.918	0.760	0.780
C16:1	3.01 ± 0.003	0.23	3.0	3.020	2.55 ± 0.003	0.277	2.540	2.560
C17:1	0.15 ± 0.003	4.71	0.140	0.160	0.22 ± 0.004	3769	0.210	0.230
C18:1n9	31.44 ± 0.004	0.03	31.430	31.450	29.802 ± 0.004	0.028	29.790	29.810
C22:1n9	0.06 ± 0	1.18	0.059	0.061	0.0802 ± 0	1.043	0.079	0.081
C24:1n9	0.83 ± 0.003	0.85	0.820	0.840	0.814 ± 0.005	1.401	0.800	0.830
MUFA	36.37				34.30			
C18:2n6	26.25 ± 0.003	0.03	26.240	26.260	26.83 ± 0.003	0.026	26.820	26.840
C18:3n6	0.19 ± 0.003	3.72	0.180	0.200	0.162 ± 0.004	5.165	0.150	0.170
C18:3n3	0.43 ± 0.007	3.68	0.410	0.450	0.72 ± 0.004	0.861	0.960	0.980
C18:2	0.23 ± 0.003	3.07	0.220	0.240	0.452 ± 0.004	1.851	0.440	0.460
C18:4n3	0.09 ± 0	0.79	0.089	0.091	0.102 ± 0.004	8.203	0.090	0.110
C20:2n6	0.37 ± 0.004	2.27	0.360	0.380	0.352 ± 0.004	2.377	0.340	0.360
C20:3n6	0.28 ± 0.03	2.53	0.270	0.290	0.352 ± 0.003	2.377	0.340	0.360
C20:3n3	3.55 ± 0.007	0.47	3.540	3.580	3.562 ± 0.004	0.235	3.550	3.570
C20:4n6	0.11 ± 0.003	6.43	0.100	0.120	0.102 ± 0.004	8.203	0.090	0.110
C22:2n6	0.05 ± 0	1.41	0.049	0.051	0.080 ± 0	1.043	0.079	0.081
C22:3n6	0.08 ± 0	0.88	0.079	0.081	0.26 ± 0.003	2.720	0.250	0.270
C20:5n3	0.27 ± 0.003	0.16	0.260	0.280	0.22 ± 0.004	0.194	0.210	0.230
C22:4n6	0.27 ± 0.003	0.16	0.260	0.280	0.314 ± 0.004	0.169	0.300	0.320
C22:5n3	0.19 ± 0.003	0.19	0.180	0.200	0.18 ± 0.003	0.198	0.170	0.190
PUFA	32.52				34.14			
Other fat acids	0.23 ± 0.005	0.22	0.210	0.240	0.38 ± 0.004	0.148	0.370	0.390
Ω_3	1.48				2.52			
Ω_6	30.88				31.40			
Ω_6/Ω_3	20.86				12.48			
SFA/UFA	0.45				0.46			
PUFA/MUFA	0.89				1.0			

SFA—saturated fat acids, MUFA—monounsaturated fat acids, PUFA—polyunsaturated fat acids, UFA—unsaturated fat acids.

The data obtained on saturated fatty acids from the musculature of the upper thighs revealed for both batches (Lm, Lexp) that the main constituent is palmitic acid C16:0; thus, for Lm the average was 20.47 ± 0.0005 g/100 g, with variation of 20.45 g/100 g (minimum) and 20.48 g/100 g (maximum), while for the Lexp the average was 20.14 ± 0.003 g/100 g, with variation of 20.13 g/100 g (minimum) and 20.15 g/100 g (maximum). The constituent with the lowest average for both batches was represented by caprylic acid C8:0,

with a value of 0 g/100 g. The total saturated fatty acids resulting from the upper thigh muscles was 31.98 g/100 g for roosters from Lm and 31.51 g/100 g for capons (Table 2). In the case of monounsaturated fatty acids—dominant in both cases—was oleic acid C18:1n9, with an average for Lm of 31.34 ± 0.0003 g/100 g, the minimum being 31.33 g/100 g and the maximum 31.35 g/100 g, while for the Lexp the average was 27.47 ± 0.0003 g/100 g. The total of monounsaturated fatty acids was 35.23 g/100 g for Lm and 32.23 g/100 g for Lexp. Results on the polyunsaturated fatty acids indicated for roosters (Lm) a total value of 28.15 ± 0.003 g/100 g: the highest value in the case of linoleic acid C18: 2n6. For the experimental group, the content in polyunsaturated fatty acids registered a value of 29.18 ± 0.003 g/100 g, with variation of 29.17 g/100 g (minimum) and 29.19 g/100 g (maximum). The total of polyunsaturated fatty acids was 32.56 g/100g for Lm and 36.04 g/100 g for Lexp. Regarding the ratio between fatty acids Ω_6 and Ω_3 in upper thighs, the values calculated were 15.61 for Lm and 17.85 for Lexp. The SFA/UFA ratio was 0.47 for the control batch and 0.46 for the experimental batch; the PUFA /MUFA ratio had values of 0.92 (Lm) and 1.12 (Lexp) (Table 2).

Table 2. Upper thighs fatty acids.

Specification	Chest							
	Lm				Lexp			
Fatty Acids	Statistical Estimators							
	X ± s_x (g AG/100 g)	V%	Min. (g AG/100 g)	Max. (g AG/100 g)	X ± s_x (g AG/100 g)	V%	Min. (g AG/100 g)	Max. (g AG/100 g)
C8:0	0	0	0	0	0	0	0	0
C10:0	0.02 ± 0.0003	3.53	0.019	0.021	0.04 ± 0	1.77	0.039	0.041
C12:0	0.05 ± 0.0003	1.41	0.049	0.051	0.11 ± 0.003	7.47	0.10	0.12
C14:0	0.50 ± 0.0037	1.68	0.49	0.51	0.64 ± 0.003	1.31	0.63	0.65
C15:0	0.08 ± 0.0003	1.05	0.079	0.081	0.10 ± 0.003	8.20	0.09	0.11
C16:0	20.47 ± 0.005	0.05	20.45	20.48	20.14 ± 0.003	0.04	20.13	20.15
C17:0	0.16 ± 0.003	5.16	0.15	0.17	0.20 ± 0.003	4.14	0.19	0.21
C18:0	10.63 ± 0.003	0.06	10.62	10.64	10.12 ± 0.003	0.07	10.11	10.13
C24:0	0.05 ± 0.0003	1.68	0.049	0.051	0.08 ± 0	1.05	0.079	0.081
SFA	31.98				31.51			
C14:1	0.07 ± 0.0003	1.01	0.069	0.071	0.09 ± 0	0.93	0.089	0.091
C15:1	0.20 ± 0.005	5.42	0.19	0.22	0.64 ± 0	1.30	0.63	0.65
C16:1	3.05 ± 0.0003	0.02	3.049	3.051	3.04 ± 0.003	0.28	3.03	3.05
C17:1	0.11 ± 0.0003	7.75	0.10	0.12	0.22 ± 0.003	3.21	0.21	0.23
C18:1n9	31.34 ± 0.0003	0.03	31.33	31.35	27.47 ± 0.003	0.30	27.46	27.47
C22:1n9	0.03 ± 0.0003	2.36	0.029	0.031	0.02 ± 0	3.54	0.019	0.021
C24:1n9	0.42 ± 0.003	2.0	0.41	0.43	0.75 ± 0.003	1.11	0.74	0.76
MUFA	35.23				32.23			
C18:2n6	28.15 ± 0.003	0.03	28.14	28.16	29.18 ± 0.003	0.02	29.17	29.19
C18:3n6	0.16 ± 0.003	4.42	0.15	0.17	0.18 ± 0.003	4.70	0.17	0.19
C18:3n3	1.06 ± 0.005	1.07	1.05	1.08	0.95 ± 0.003	0.88	0.94	0.96
C18:2	0.416 ± 0.005	2.74	0.40	0.43	0.27 ± 0.003	2.62	0.26	0.28
C18:4n3	0.062 ± 0.002	7.30	0.059	0.07	0.06 ± 0	1.18	0.059	0.061
C20:2n6	0.28 ± 0.003	2.53	0.27	0.29	0.35 ± 0.003	2.02	0.34	0.36
C20:3n6	0.21 ± 0.002	3.37	0.20	0.22	0.34 ± 0.003	2.45	0.33	0.35
C20:3n3	1.53 ± 0.005	0.74	1.52	1.55	3.99 ± 0.003	0.21	3.98	4.0
C20:4n6	0.10 ± 0.005	10.96	0.09	0.12	0.08 ± 0	1.04	0.079	0.081
C22:2n6	0.04 ± 0	1.76	0.039	0.041	0.09 ± 0	0.79	0.089	0.091
C22:3n6	0.05 ± 0	1.41	0.049	0.051	0.06 ± 0	1.18	0.059	0.061
C20:5n3	0.11 ± 0.003	0.27	0.10	0.12	0.17 ± 0.003	0.22	0.16	0.18
C22:4n6	0.13 ± 0.003	0.23	0.12	0.14	0.13 ± 0.003	0.26	0.12	0.14

Table 2. *Cont.*

Specification	Chest							
	Lm				Lexp			
Fatty Acids	Statistical Estimators							
	X ± s_x (g AG/100 g)	V%	Min. (g AG/100 g)	Max. (g AG/100 g)	X ± s_x (g AG/100 g)	V%	Min. (g AG/100 g)	Max. (g AG/100 g)
C22:5n3	0.08 ± 0	0.09	0.079	0.081	0.17 ± 0.003	0.22	0.16	0.18
PUFA	32.56				36.04			
Other fat acids	0.22 ± 0.006	0.26	0.20	0.24	0.22 ± 0.006	0.24	0.20	0.23
Ω_3	1.95				1.91			
Ω_6	30.43				34.10			
Ω_6/Ω_3	15.61				17.85			
SFA/UFA	0.47				0.46			
PUFA/MUFA	0.92				1.12			

SFA—saturated fat acids, MUFA—monounsaturated fat acids, PUFA—polyunsaturated fat acids, UFA—unsaturated fat acids.

The data obtained on saturated fatty acids from the musculature of the drumstick revealed for both batches (Lm, Lexp) that the main constituent is palmitic acid C16:0; thus, for Lm the average was 21.42 ± 0.002 g/100 g, with variation of 21.41 g/100 g (minimum) and 21.42 g/100 g (maximum), while for the Lexp the average was 20.69 ± 0.003 g/100 g, with variation of 20.68 g/100 g (minimum) and 20.70 g/100 g (maximum). The constituent with the lowest average for both batches was represented by caprylic acid C8:0, with a value of 0 g/100 g. The total saturated fatty acids resulting from the drumstick muscles was 30.25 g/100 g for roosters from Lm and 31.06 g/100 g for capons (Table 3). In the case of monounsaturated fatty acids—dominant in both groups—was oleic acid C18:1n9, with an average for Lm of 32.86 ± 0.002 g/100 g, the minimum being 32.85 g/100 g and the maximum 32.86 g/100 g, while for the Lexp the average was 29.37 ± 0.002 g/100 g. The total of monounsaturated fatty acids was 37.45 g/100 g for Lm and 34.08 g/100 g for Lexp. Results on polyunsaturated fatty acids indicated for roosters (Lm) a total value of 27.50 ± 0.005 g/100 g; the highest value in the case of linoleic acid C18: 2n6. For the experimental group, the content in linoleic acid registered a value of 27.76 ± 0.004 g/100 g, with variation of 27.75 g/100 g (minimum) and 27.77 g/100 g (maximum). The total of polyunsaturated fatty acids was 32.17 g/100 g for Lm and 34.64 g/100 g for Lexp. Regarding the ratio between fatty acids Ω_6 and Ω_3 in the drumstick, the values calculated were 20.13 for Lm and 15.15 for Lexp. The SFA/UFA ratio was 0.43 for the control batch and 0.45 for the experimental batch; the PUFA /MUFA ratio had values of 0.86 (Lm) and 1.02 (Lexp) (Table 3).

Table 3. Drumstick fatty acids.

Specification	Chest							
	Lm				Lexp			
Fatty Acids	Statistical Estimators							
	X ± s_x (g AG/100 g)	V%	Min. (g AG/100 g)	Max. (g AG/100 g)	X ± s_x (g AG/100 g)	V%	Min. (g AG/100 g)	Max. (g AG/100 g)
C8:0	0	0	0	0	0	0	0	0
C10:0	0.02 ± 0	3.54	0.019	0.021	0.03 ± 0	2.36	0.029	0.031
C12:0	0	0	0	0	0.02 ± 0	3.54	0.019	0.021
C14:0	0.48 ± 0.003	1.47	0.47	0.49	0.61 ± 0.003	1.37	0.60	0.62
C15:0	0.09 ± 0	0.50	0.089	0.09	0.09 ± 0.003	0.79	0.09	0.091
C16:0	21.42 ± 0.002	0.03	21.41	21.42	20.69 ± 0.003	0.03	20.68	20.70
C17:0	0.18 ± 0.003	3.93	0.17	0.19	0.19 ± 0.003	4.45	0.18	0.20
C18:0	8.03 ± 0	0.005	8.029	8.03	9.37 ± 0.003	0.08	9.36	9.38
C24:0	0.04 ± 0	1.77	0.039	0.041	0.07 ± 0	1.01	0.069	0.071

Table 3. *Cont.*

Specification	Chest							
	Lm				Lexp			
Fatty Acids	Statistical Estimators							
	$X \pm s_x$ (g AG/100 g)	V%	Min. (g AG/100 g)	Max. (g AG/100 g)	$X \pm s_x$ (g AG/100 g)	V%	Min. (g AG/100 g)	Max. (g AG/100 g)
SFA	30.25				31.06			
C14:1	0.070 ± 0	0.79	0.069	0.07	0.07 ± 0	1.01	0.069	0.071
C15:1	0.28 ± 0.003	2.53	0.27	0.29	0.42 ± 0.003	1.98	0.41	0.43
C16:1	3.46 ± 0.003	0.24	3.45	3.47	3.26 ± 0.003	0.26	3.25	3.27
C17:1	0.19 ± 0.006	8.15	0.17	0.21	0.16 ± 0.004	6.25	0.15	0.17
C18:1n9	32.86 ± 0.002	0.01	32.85	32.86	29.37 ± 0.002	0.02	29.36	29.37
C22:1n9	0.03 ± 0	1.50	0.029	0.03	0.05 ± 0	1.68	0.049	0.051
C24:1n9	0.55 ± 0.007	2.87	0.53	0.57	0.75 ± 0.003	0.94	0.74	0.76
MUFA	37.45				34.08			
C18:2n6	27.50 ± 0.005	0.04	27.49	27.52	27.76 ± 0.004	0.03	27.75	27.77
C18:3n6	0.2 ± 0.003	3.54	0.19	0.21	0.18 ± 0.003	4.60	0.17	0.19
C18:3n3	0.86 ± 0.006	1.64	0.84	0.88	0.90 ± 0.003	0.79	0.89	0.91
C18:2	0.06 ± 0.0004	1.51	0.058	0.06	0.26 ± 0.03	2.72	0.25	0.27
C18:4n3	0.30 ± 0.006	4.71	0.28	0.32	0.17 ± 0.003	4.16	0.16	0.18
C20:2n6	0.34 ± 0.002	1.60	0.34	0.35	0.60 ± 0.003	1.45	0.57	0.59
C20:3n6	0.27 ± 0.004	4.09	0.25	0.28	0.47 ± 0.002	1.18	0.46	0.47
C20:3n3	2.02 ± 0	0.35	2.019	2.021	3.46 ± 0.003	0.20	3.45	3.47
C20:4n6	0.04 ± 0	1.38	0.039	0.04	0.03 ± 0	2.36	0.029	0.031
C22:2n6	0.02 ± 0.0002	2.26	0.019	0.020	0.06 ± 0	1.17	0.059	0.061
C22:3n6	0.03 ± 0	2.36	0.029	0.031	0.25 ± 0.003	0.17	0.24	0.26
C20:5n3	0.18 ± 0.008	0.32	0.16	0.21	0.26 ± 0.003	0.18	0.25	0.27
C22:4n6	0.23 ± 0.005	0.22	0.21	0.24	0.24 ± 0.003	0.23	0.23	0.25
C22:5n3	0.06 ± 0.0008	0.17	0.058	0.063	0.20 ± 0.003	0.19	0.19	0.21
PUFA	32.17				34.64			
Other fat acids	0.14 ± 0.007	0.34	0.12	0.16	0.22 ± 0.005	0.23	0.20	0.23
Ω_3	1.52				2.15			
Ω_6	30.60				32.46			
Ω_6/Ω_3	20.13				15.10			
SFA/UFA	0.43				0.45			
PUFA/MUFA	0.86				1.02			

FA—saturated fat acids, MUFA—monounsaturated fat acids, PUFA—polyunsaturated fat acids, UFA—unsaturated fat acids.

4. Conclusions

Several factors can affect the quality of the meat, some of which act during the life of the birds and others which act during the killing of the birds (e.g., stunning, bleeding, scratching, or refrigerating the carcasses). Capon meat has a number of biological features that are highly valuable, which is why their use in intensive systems has a lot of potential. As far as research is concerned, capon meat obtained from the Transylvanian Naked Neck breed can be considered as high quality, due to its high proportion of polyunsaturated fatty acids. We recommend continuing research in this direction.

Author Contributions: Conceptualization: M.G.U.; methodology and validation: M.G.U., R.R.-R. and C.M.C.; software: R.R.-R. and C.M.C.; formal analysis: C.M.C., M.G.U. and R.R.-R.; investigation, resources, data curation and writing—original draft preparation: C.M.C.; Writing—review and editing: C.M.C., M.G.U. and R.R.-R.; visualization: M.G.U. and R.R.-R.; supervision: M.G.U.; Project administration: C.M.C. and M.G.U.; funding acquisition: C.M.C. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Winter, A.R.; Funk, E.M. *Poultry Science and Practice*; J.B. Lippincott Co.: New York, NY, USA, 1960.
2. Amorim, A.; Rodrigues, S.; Pereira, E.; Teixeira, A. Physic-ochemical composition and sensory quality evaluation of caponand rooster meat. *Poult. Sci.* **2016**, *95*, 1211–1219. [CrossRef] [PubMed]
3. Calik, J. Capon production–breeding stock, rooster castrationand rearing methods, and meat quality—A review. *Ann. Anim. Sci.* **2014**, *4*, 769–777. [CrossRef]
4. Sirri, F.; Bianchi, M.; Petracci, M.; Meluzzi, A. Influence of partial and complete caponization on chicken meat quality. *Poult. Sci.* **2009**, *88*, 1466–1473. [CrossRef] [PubMed]
5. Tor, M.; Estany, J.; Francesch, A.; Cubil'o, M.D. Comparison of fatty acid profiles of edible meat, adipose tissues and muscles between cocks and capons. *Anim. Res.* **2005**, *54*, 413–424. [CrossRef]
6. Miguel, J.A.; Ciria, J.; Asenjo, B.; Calvo, J.L. Effect of caponisation on growth and on carcass and meat characteristics in Castellana Negra native Spanish chickens. *Animal* **2008**, *2*, 305–311. [CrossRef] [PubMed]
7. Chen, K.L.; Chi, W.T.; Chiou, P.W. Caponization and testosterone implantation effects on blood lipid and lipoprotein profile in male chickens. *Poult. Sci.* **2005**, *84*, 547–552. [CrossRef]
8. Sinanoglou, V.J.; Mantis, F.; Miniadis-Meimaroglou, S.; Symeon, G.K.; Bizelis, I.A. Effects of caponisation on lipidand fatty acid composition of intramuscular and abdominal fatof medium-growth broilers. *Br. Poult. Sci.* **2011**, *52*, 310–317. [CrossRef] [PubMed]