



Welcome

COMPARATIVE EGG YOLK FATTY ACID PROFILE OF ASEEL AND GUINEA FOWL

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Introduction

- Egg is one of most important components of human diet.
- Fatty acids composition in egg lipids have been highly concerned to human health - SFA, MUFA and PUFA – Chow [1992].
- Inadequate intake of n3 PUFA, - DHA, (C22:6n-3), negatively influences brain growth and functional parameters in human infants

  [Poławska *et al.* 2013]
- The n-3 and n-6 PUFAs are considered essential for growth and development of children as precursors of composite hormones known as eicosanoids, involved in several metabolic processes of great importance for the human organism, mainly related to cardiovascular activity [Mustonen *et al*. 2009].

Introduction

- Long chain n-3 PUFAs cannot be synthesized within the human organism and must be supplied with the diet [Chow 1992].
- Poultry egg is one of the best sources of omega 3 in all over the world and must regularly be consumed especially by growing individuals [Sauerwald *et al.* 1997].
- The fatty acid composition of poultry egg may be affected, among others, by diet, age of hen and geographic allocation [Milinsk *et al.* 2003].
- The composition of eggs of different native chicken eggs needs to be investigated and compared.

objective

- To determine and compare the fatty acid composition of egg yolk of Aseel and Guinea fowl maintained under intensive system of management

Materials and Methods

- A total of 12 eggs comprising of six eggs from each native chicken breed collected at 40th week of age were utilized.

- Myristic acid (C14:0), Palmitic acid (C16:0), Stearic acid (C18:0), Arachidic acid (C20:0), Behenic acid (C22:0), Oleic acid (C18:1 n9), Linoleic acid (C18:2 n6), Palmitoleic acid (C16:1), Linolenic acid (C18:3 n3), Ecosapentaenoic acid (EPA - 20:5(n-3)), and Docosahexaenoic acid (DHA-22:6(n-3)) were determined

- SFA, PUFA, MUFA, n-6 fatty acids, n-3 fatty acids, total unsaturated fatty acids, SFA/ PUFA ratio, PUFA/MUFA ratio and n-6:n-3 ratio were calculated.

- Statistical analysis

EGGS

Aseel eggs



Guinea fowl eggs



Composition of basal diet-Aseel

Feed Ingredients	Chick Mash	Grower Mash	Layer Mash
Maize	43	24	54
Cumbu	-	24	-
DORB	20	27	9
SBOM	15	5	14
SFOC EXT	11	11	8
Dry Fish	10	7	8
Mineral Mixture	1	1	2
Shell grit	-	-	4
DCP	-	1	1
TOTAL	100	100	100

Nutrient composition-Aseel

Nutrient	Chick Mash	Grower Mash	Layer Mash
Calculated Values			
Crude Protein (%)	20.49	17.09	18.04
M.E K cal/kg	2700	2606	2706
Calcium (%)	1.17	1.14	3.02
Av.Phosphorous(%)	0.4	0.52	0.55
Lysine(%)	1.15	0.85	0.97
Methionine(%)	0.42	0.36	0.3

Composition of basal diet-Guinea fowl

S.No	Ingredients / Age (in weeks)	GF pre brooder	GF brooder	GF grower	GF breeder
		0-4	5-8	9-20	20+
1	Maize	44	40	39.5	41
2	Cumbu	10.75	12	15	14.5
3	DORB		17.5	21.25	9
4	Soya meal	36.25	21.5	8.5	11.5
5	SFOC			7	7
6	Dry fish	7.5	8	7	10
7	Min. mix	0.5	0.5	1	1.5
8	Shell grit				5
9	Calcite				
10	DCP	1	0.5	0.75	0.5
	Total	100	100	100	100

Nutrient composition-Guinea fowl

	Nutrients	GF pre brooder	GF brooder	GF grower	GF breeder
1	Cr. Protein %	24.55	20.53	17.08	18.11
2	M.E K cal / kg	2852	2801	2748	2657
3	Calcium	1.18	1.08	1.18	3.41
4	Av.Phosphorus	0.52	0.45	0.51	0.54
5	Lysine	1.45	1.15	0.86	0.99
6	Methionine	0.42	0.38	0.35	0.37

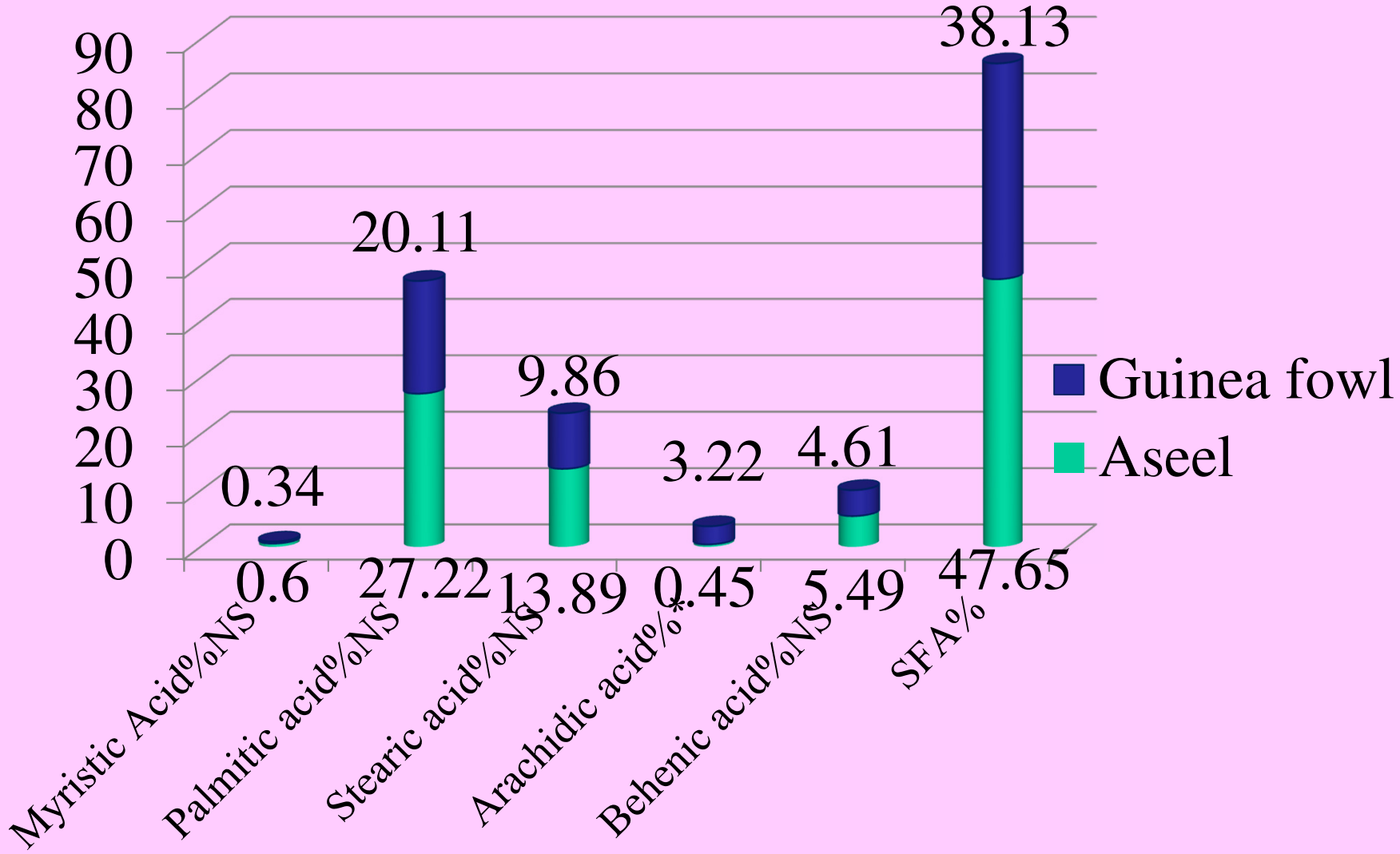
Mean(S.E.)Comparative Egg Yolk Saturated Fatty Acids Profile of Aseel and Guineafowl

Eggs	Saturated Fatty Acids					
	Myristic Acid%*	Palmitic acid%**	Stearic acid%**	Arachidic acid%**	Behenic acid%*	Total SFA%**
CN	C14:0	C16:0	C18:0	C20:0	C22:0	
Aseel	0.60^{b} ±0.02	27.22^{b} ±0.73	13.89^{b} ±0.37	0.45^{b} ±0.04	5.49^{b} ±0.21	47.65^{b} ±0.54
Guinea fowl	0.34^{a} ±0.11	20.11^{a} ±0.76	9.86^{a} ±0.95	3.22^{a} ±0.17	4.61^{a} ±0.21	38.13^{a} ±1.88
Overall Mean	0.47 ±0.07	23.67 ±1.18	11.88 ±0.78	1.83 ±0.42	5.05 ±0.19	42.89 ±1.71

Means having the different superscript for treatments differ significantly (P<0.05)

Guinea fowl eggs had significantly (P<0.01) lower SFA

Mean(S.E.) Comparative Egg Yolk Saturated Fatty Acids Profile of Aseel and Guineafowl



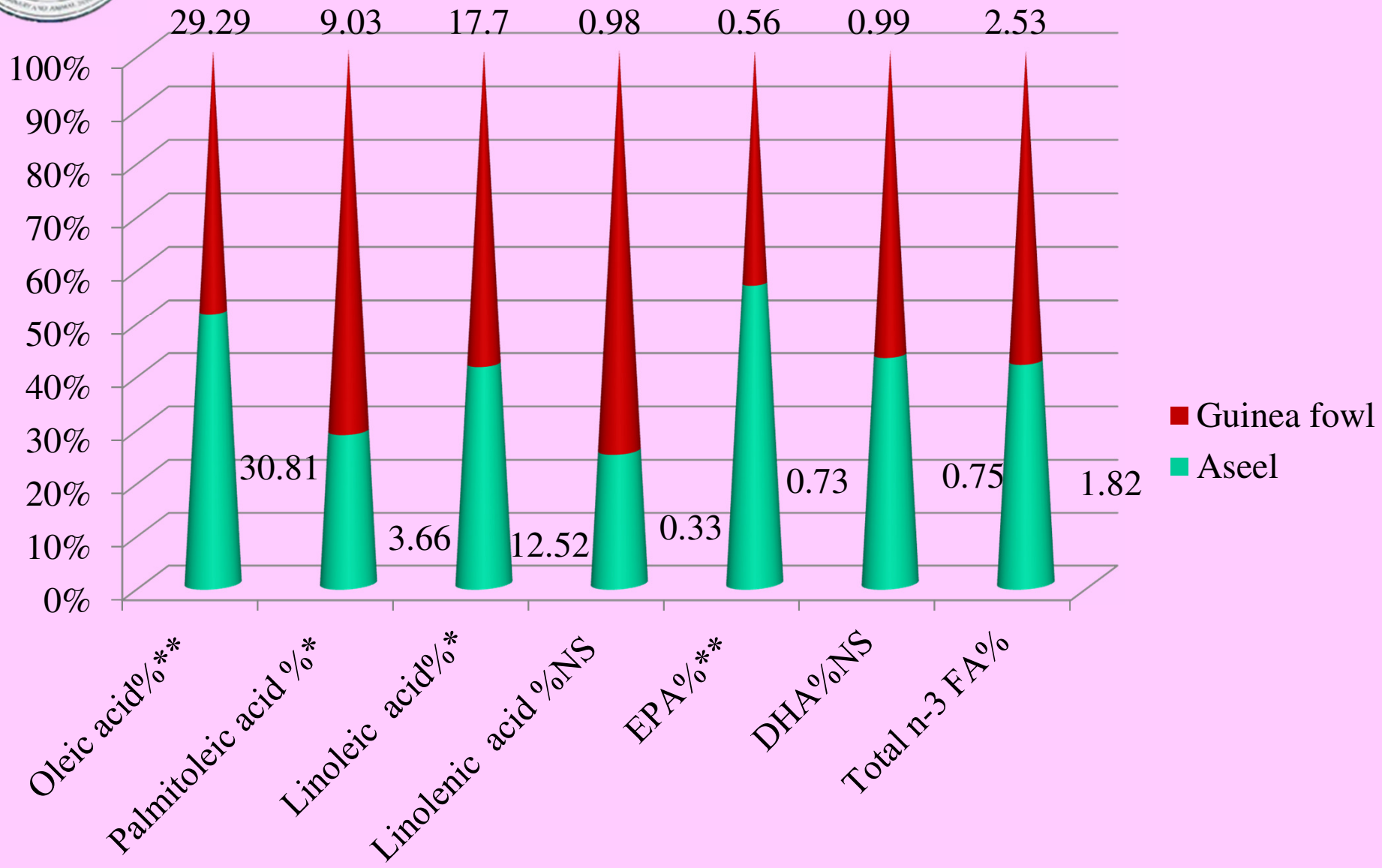
Mean(S.E.) Comparative Egg Yolk Poly UnSaturated Fatty Acid Profile of Aseel and Guineafowl

Eggs	MUFA	Palmit oleic acid %** (n-7)	PUFA				
	Oleic acid %*		Omega 6 Fatty Acid (n-6)	Omega 3 Fatty Acids (n-3)			
			Linoleic acid %*	Linolenic acid %**	EPA %NS	DHA %NS	Total n-3 FA %*
CN	C18:1	C16:1	C18:2	C18:3	C20:5	C22:6	
Aseel	30.81^{a} ±0.48	3.66^{b} ±0.18	12.52^{b} ±0.70	0.33^{b} ±0.11	0.73 ±0.08	0.75 ±0.12	1.82^{b} ±0.26
Guinea fowl	29.29^{b} ±0.25	9.03^{a} ±1.20	17.70^{a} ±1.58	0.98^{a} ±0.12	0.56 ±0.08	0.99 ±0.13	2.53^{a} ±0.15
Overall Mean	30.05 ±0.35	6.35 ±0.99	15.11 ±1.13	0.66 ±0.13	0.65 ±0.06	0.87 ±0.09	2.17 ±0.18

Means having the different superscript for treatments differ significantly (P<0.05)

Guinea fowl eggs had significantly (P<0.01) Higher n-6,7, n-3 Linolenic acid % and Total n-3 FA %

Mean(S.E.) Comparative Egg Yolk Un Saturated Fatty Acids Profile of Aseel and Guineafowl



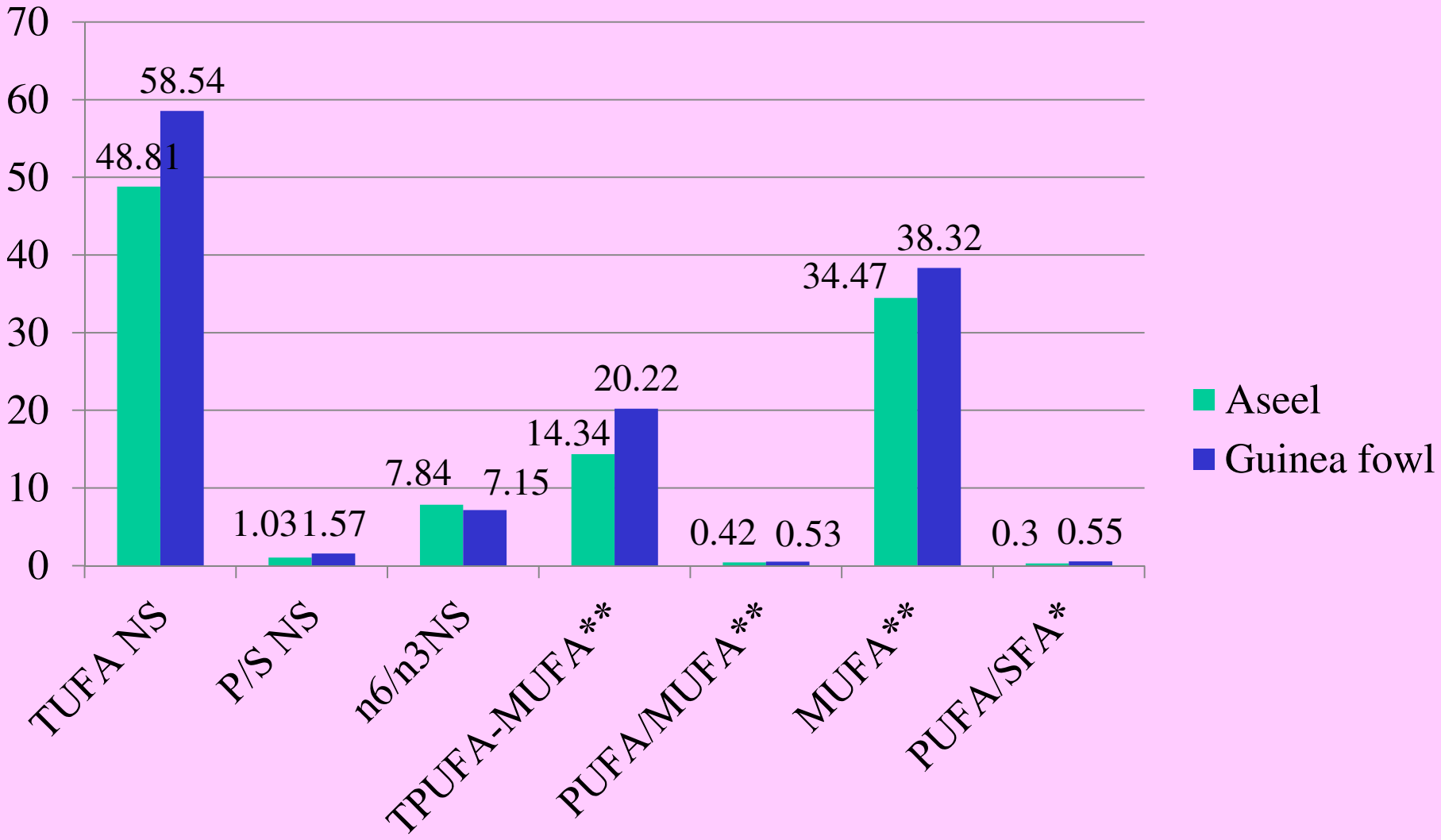
Mean(S.E.) Comparative Egg Yolk Fatty Acid Profile of Aseel and Guineafowl

Eggs	TUFA **	n6/n3^{NS}	PUFA**	PUFA/ MUFA*	PUFA/ SFA**
Aseel	48.81^{b} ±0.71	7.84 ±1.36	14.34^{b} ±0.69	0.42^{b} ±0.02	0.30^{b} ±0.02
Guinea fowl	58.54^{a} ±2.60	7.15 ±0.78	20.22^{a} ±1.58	0.53^{a} ±0.03	0.55^{a} ±0.07
Overall Mean	53.68 ±1.95	7.50 ±0.75	17.28 ±1.21	0.47 ±0.02	0.42 ±0.05

Means having the different superscript for treatments differ significantly (P<0.05)

Guinea fowl eggs had significantly (P<0.01) higher TUFA, PUFA and PUFA /SFA ratio

Comparative Egg Yolk Un Saturated Fatty Acids Profile of Aseel and Guineafowl



Results

Guinea fowl eggs had significantly (P<0.01)

- ✓ Lower total SFA (38.13±1.88)
- ✓ **Higher Palmitoleic acid (9.03±1.20)**
- ✓ **n3- Linolenic acid (0.98±0.12)**
- ✓ **TUFA (58.54±2.60)**
- ✓ **PUFA (20.22±1.58)**
- ✓ **PUFA /SFA ratio (0.55±0.07)**

Significantly higher (P<0.05)

- ✓ **n6-Linoleic acid (17.70±1.58)**
- ✓ **total n3 fatty acids (2.53±0.15)**

Results

Aseel eggs had significantly (P<0.01)

- ✓ **higher n-9 Oleic acid (MUFA)(30.81±0.48)**
- ✓ **lower Arachidic acid (0.45±0.04)**

Non significant

Ecosapentaenoic Acid

Docosahexaenoic acid

n-6:n-3 ratio

CONCLUSION

Eggs of of Aseel and Guineafowl were found valuable for human consumption as fatty acids source.

Guinea fowl eggs were found to be most beneficial due to their higher total n-3 fatty acid, n-6 Linoleic acid, TUFA, PUFA, PUFA / MUFA ratio and PUFA / SFA ratio.

Thank you

