

(/ / : // :)

(Salmo trutta caspius)

/ (SD±)
(FS) (SF) (FFF)
(SFS) (FSF)
GC/FID (SSS)
(/) (MUFA)
(PUFA) (SFA) SSS /
(LNA) (P< /) SSS / / FFF / /
(DHA) (EPA) SSS / /
SSS / / FFF / /

...
.
.(Sargent, 1999)

DHA⁵ EPA⁴

Gurney *et al.*, 2003; Furne)

(*et al.*, 2008

(Ali *et al.*, 2003)

(McCue, 2008)

(McCue,

2003; Ali *et al.*, 2008)

(SFA¹)

(MUFA²)

(HUFA³)

.(Durazo-Beltrán, 2004)

MUFA

/ (SD±)
()
/

(Einen *et al.*,)

1998

.(Daud Om, 2003)

(Ali *et al.*,

(*Salmo trutta caspius*)

.2003)

(SD± /)

(SD± /)

⁴ Eicosapentaenoic Acid

⁵ Docosahexaenoic Acid

¹ Saturated Fatty Acid

² Mono Unsaturated Fatty Acid

³ High Unsaturated Fatty Acid

						+
						FFF*
						++
						SSS**
						FS
						SF
						FSF
						SFS

(Falahatkar *et al*, 2009)

Feeding F* +
 Starvation S** ++

()		()	
(%)		(%)	
/	ΣSFA	/	C :
/	ΣMUFA	/	C :
/	ΣPUFA	/	C :
/	PUFA C /C ,	/	C : n-
/	ΣN-	/	C :
/	ΣN-	/	C : n-
/	n- /n-	/	C : n-
/	ΣHUFA	/	C : n-
/	DHA/EPA	/	C : n-
/	ARA/EPA	/	C :
		/	C : n-
(%)		/	C : n-
/		/	C : n-
/		/	C : n-
/		/	C : n-
/		/	C : n-
	(kcal/kg)	/	C : n-

...

et al, 1961) (°C) (.C : C : C : C : : ΣSFA
(Metcalf
: n C : n C : n : ΣMUFA
.C : n C : n C : n C
C : n C : n C : n : ΣPUFA
.C : n C : n C : n C : n C : n
, : C , C : n , C : n : C
.C : n , C : n , C : n
: n- C : n- C : n- : ΣHUFA
C : n- C : n- C : n- C

(version6.41) . ()
Varian Star Chromatography Software (Sudagar *et al*, 2009) ppm

")
Completely Randomized Design (Folch *et al*, 1957) (

Excel SPSS 17 "

2007

Shapiro-Wilk

Leven

One Way ANOVA

(°C) %
)BF₃

C : n-
 SSS
 PUFA C :C ,
 SSS SFS FS

(P < /)
 HUFA C

PUFA :C ,
 HUFA C (OLA)
 (/) FFF
 (D A :) FS (P < /)
 B) DHA EPA / / / SSS SFS
 (C -) (C :)
 / :SSS SFS FS FFF
 (/ / /)
) DHA EPA AA²
 (P < /) (/) / / / SSS SFS FS FFF
 / / :SSS SFS FS) (P < /) (/
 (/ SF FSF
 (LA)
 (P < /)

n- n-
 n- (P < /)
 n-
 ()
 LNA
 (P < /) SSS
 PUFA C :C , (B A)

⁶ Oleic acid
⁷ Arachidonic acid

...

()

(mean±S.D., n=)

(none detected)

n.d. (P< /)

SF	FSF	SSS	SFS	FS	() FFF	
/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	C :
/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	C : n
/ ± / ^b	/ ± / ^{abc}	/ ± / ^a	/ ± / ^{abc}	/ ± / ^{abc}	/ ± / ^{bc}	C :
/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	n- : C
/ ± / ^b	/ ± / ^{ab}	/ ± / ^a	/ ± / ^b	/ ± / ^{ab}	/ ± / ^c	C :
/ ± / ^{ab}	/ ± / ^a	/ ± / ^c	/ ± / ^{bc}	/ ± / ^{abc}	/ ± / ^{abc}	C : n-
/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	C : n-
/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	C : n-
/ ± / ^a	/ ± / ^a	/ ± / ^b	/ ± / ^a	/ ± / ^a	/ ± / ^a	C : n-
/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	C :
/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	C : n-
/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	C : n-
/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	C : n-
/ ± / ^c	/ ± / ^d	/ ± / ^a	/ ± / ^b	/ ± / ^c	/ ± / ^d	C : n-
/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	C : n-
/ ± /	/ ± /	/ ± /	/ ± /	/ ± /	n.d.	C : n-
/ ± / ^c	/ ± / ^c	/ ± / ^a	/ ± / ^c	/ ± / ^b	/ ± / ^c	C : n-
/ ± / ^{bc}	/ ± / ^c	/ ± / ^a	/ ± / ^{ab}	/ ± / ^{abc}	/ ± / ^c	C : n-

:FS

:SF

:() FFF

:SFS

:FSF

:SSS

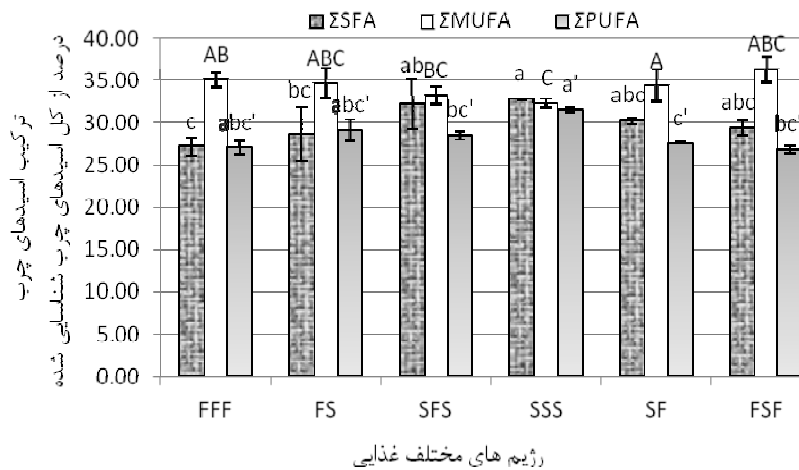
.C : C : C : C : : ΣSFA

.C : n C : n C : n C : n C : n C : n : ΣMUFA

.C : n C : n C : n C : n C : n C : n C : n : ΣPUFA

.C : n , C : n , C : n , : C , C : n , C : n : C

: n- C : n- C : n- C : n- C : n- C : n- : ΣHUFA



ترکیب اسیدهای چرب
 درصد از کل اسیدهای چرب تشکیل شده

رژیم های مختلف غذایی

PUFA MUFA SFA

:SF () FFF (P < /)
 :SFS :FSF :SSS :FS

MUFA

(Boujard *et al*, 2002)

(utilisation)

(mobilisation)

(Sheridan, 1988)

(SFA)

(MUFA)

PUFA

OLA

(Torstensen *et al.*, 2000)

ATP

(Sargent *et al.*, 2002)

⁸β-Oxidation

MUFA

(kiessling, 1993 kiessling and)

(Brandsen *et al*, 2003)

LA OLA :

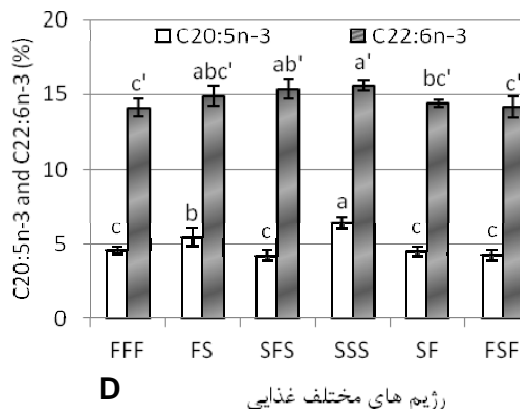
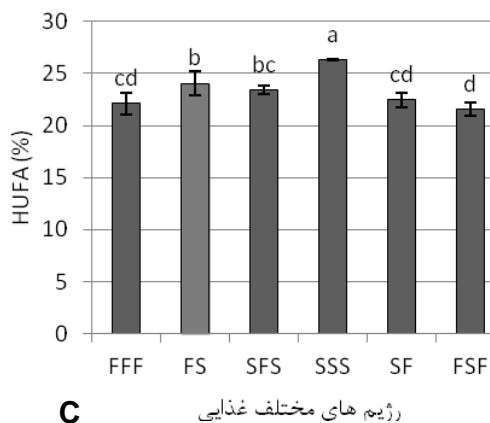
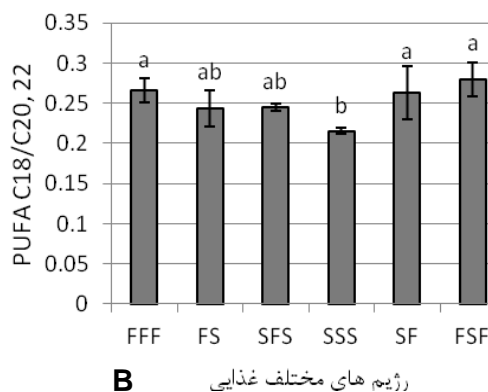
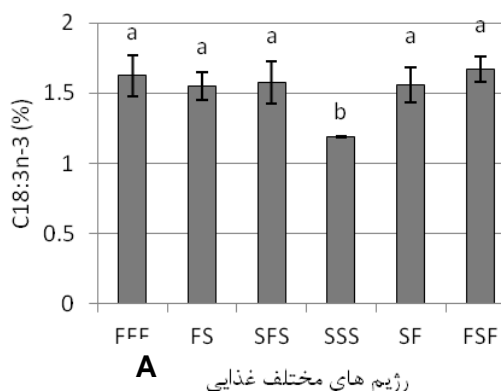
OLA

: OLA

LA

(Torstensen *et al*, 2004)

: : n - OLA



(C) EPA DHA

(B) C : n-

(A) PUFA C : C ,

(D) HUFA

:FS

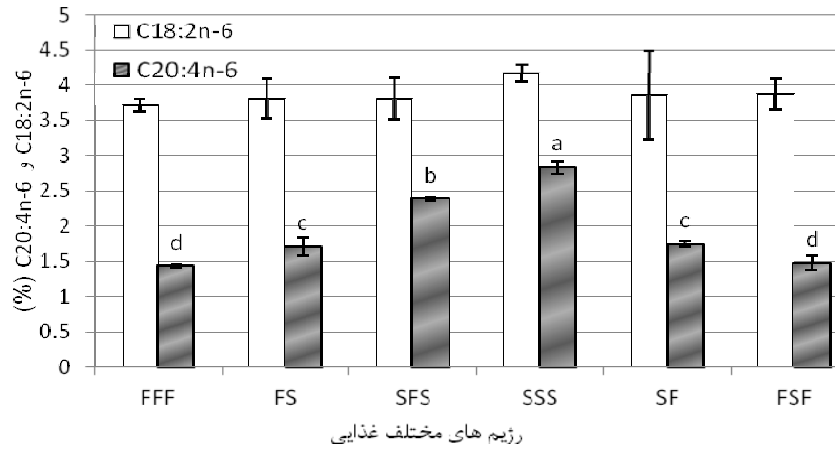
:SF

:() FFF.(P< /)

:SFS

:FSF

:SSS



رژیم های مختلف غذایی
 AA LA
 :FS :SF :FFF (P< /) :FSF :SSS
 :SFS
 LA
 (Bell et al, 2001 and 2002) (Martinez del Rio and Karasov. 2007)
 DHA HUFA - LA
 AA DHA (McCue et al, 2009)
 EPA : (Tocher, 2003) OLA
 EPA (Bell and Waagbo, 2008) Sn-
 Sn- HUFA PUFA (Sargent et al, 2002)
 DHA EPA AA DHA EPA AA
 Selective deposition
 AA DHA EPA PUFA SFA DHA AA

...

			LNA	()
LNA				
		()	LA	
DHA	EPA			LA
			()	
			LNA	
DHA EPA				PUFA C :C ,
DHA				() n- HUFA
(Peng <i>et al.</i> , 2003)	EPA			LNA
			LA	n- HUFA
	PUFA			n- HUFA
				(Rollin <i>et al.</i> , 2003)
(Peng <i>et al.</i> ,			LA	LNA
Greene and)		(2003	Ruyter)	
Ali <i>et al.</i> ,		(Selivonchick. 1990		(Bell <i>et al.</i> , 2003; <i>et al.</i> , 1997
		(2003)		LNA
				(DeLany <i>et al.</i> , 2000)
				LA
			LA	
			() AA	
			LA	
			AA	
				AA
			AA LA	LA
gibel				
			LA	n- PUFA LNA n- PUFA
(Ali <i>et al.</i> , 2001)				
				(Bell <i>et al.</i> , (2001)
()		()		EPA LNA
				EPA
				LNA
		(Leeson and Zubair. 1996)	DHA	
				EPA

EPA DHA AA

LNA

LA n- HUFA

n- HUFA

()
PUFA C :C ,

HUFA

MUFA

- AA ()

()

AA

AA

AA

AA

.(Sargent *et al.*, 1995)

(MUFA)

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Comparison of body fatty acid composition of the caspian trout parrs in feeding, starvation and refeeding periods

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(Received: 26/9/2010, Accepted: 16/3/2011)

Abstract

This study was conducted to compare the body fatty acid composition of Caspian trout (*Salmo trutta caspius*) parrs in different nutritional statuses. 900 Caspian trout parrs 12.5 (SD± 1 g) were kept at various nutritional statuses, i.e. six weeks of full feeding (FFF), three weeks starvation and three weeks of refeeding (SF), three weeks of feeding and three weeks of starvation (FS), two weeks of feeding, two weeks of starvation and two weeks of refeeding (FSF), two weeks of starvation, two weeks of feeding and two weeks of starvation (SFS) and six weeks of full starvation (SSS). After feeding with various nutritional status, body fatty acid composition was analyzed by GC/FID. Total Monounsaturated Fatty Acids (MUFA) were decreased than control treatment (35.14%) with increase in periods of starvation and reached to 32.32% in SSS treatment, while Saturated Fatty Acid (SFA) and Polyunsaturated Fatty Acid (PUFA) were increased from 27.25% and 27.10% in FFF treatment respectively to 32.81% and 31.54% in SSS treatment ($P < 0.05$). Linolenic acid (LNA) content and PUFA C_{18/C20,22} index (1.62 and 0.27% in FFF treatment respectively) were decreased with increase in periods of starvation and reached to 1.19 and 0.22% in SSS treatment, Icosapentaenoic Acid (EPA) and Docosahexaenoic Acid (DHA) were increased significantly ($P < 0.05$) inversely and reached to 4.55 and 14.12% in FFF treatment and 6.46 and 15.6% in SSS treatment. In refeeding periods, fatty acids have an invert trend and were closed to their levels in control treatment. Therefore, Caspian trout stores, converts or uses fatty acids selectively in different nutritional statuses to provide its own requirement for energy and essential fatty acids.

Keywords: Body Fatty Acid Composition, Refeeding, Starvation, Caspian Trout