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[dtrabzuni@ksu.edu.sa](mailto:dtrabzuni@ksu.edu.sa)

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Wister-albino

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( $P \leq 0.05$ )

( $P \leq 0.05$ )

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( $P \leq 0.05$ )

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( $P \leq 0.05$ )

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(Conjugated Linoleic Acid [CLA])

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.(Park and Pariza, 2007; Kramer et al., 1998; Chin et al., 1994b) - -

(Pariza et

al., 2001; Belury et al., 2003)

.(Kang et al., 2003)

(Park and Pariza, 2007;  $\beta$ -

Nagao et al., 2003b; Park et al., 1999b)

.(Belury et al., 2003; Inoue et al., 2004; Kang and Pariza , 2001)

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(Hargrave et al., 2005)

. (DeLany et al., 2000)

(Virgin Coconut Oil [VCO])

(Copra oil [CO])

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.(Nevin and Rajamohan , 2004)

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**Conjugated Linoleic Acid (CLA)**

Cognis

(Tonalin® TG 80)

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## Virgin Coconut Oil (VCO)

Certified Organic Virgin Coconut Oil

(<http://www.virgincoconutoil.co.uk>)

## Experimental Animal Diet

(Reeves, 1997)

(Dyets, Inc., Bethlehem, PA, USA)

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AIN-93M

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(Dyets. Inc):\*المصدر

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### Animals and Experimental Protocol

Wister-albino ( )

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.(Mettler PM2000, Switzerland)

(Diethyl ether)

.(Vacuette)

(Serum)

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## Biochemical Analysis

(Considine et al., 1996) :

Dignostic Biochem Canada Inc., London,  
 Ortho Clinical Diagnostic Sun Rise .Ontario, Canada  
 .Jhonson & Jhonson, New Brunswick, New Jersey, USA.

(Robbins et al., 1984) :

Abbott AxSYM System E, B2D0I0, 46-511/R7  
 Abbott Laboratories Diagnostic Division, Abbott Park, IL, USA  
 . AxSYM system

(Ravel, 1973) :(T<sub>4</sub>)

Abbott AxSYM System, List No 7A55, 34-0254R10  
 .AxSYM system

(Wild, :(T<sub>3</sub>)

Abbott AxSYM System, List No 7A52,69- 1994)  
 .AxSYM system 3563R5  
 :(TSH)

Abbott AxSYM system, (Soos and Siddle, 1982)  
 .AxSYM system List No 5C34, 34-2310R5

.(SAS, 1997)

Correlation Coefficients

.(Jhonson, 1988)

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( $P \leq 0.05$ )

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Rahman et al. (2001)

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Rahman et al.

(2001)

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الوزن (جم)	مجموعات التجربة	الوزن (جم)	مجموعات التجربة
٥,١٣±١١٥,٧٢ <sup>abc</sup>	VCO**+CLA %٠,٥	٧,٣٤±١٢٦,٦٢ <sup>ab</sup>	الضابطة
٢,٣٤±١٢٠,٢٣ <sup>abc</sup>	VCO+CLA %١	٣,٦٢±١١٢,٧٥ <sup>abc</sup>	CLA* %٠,٥
٣,٢٦±١١٤,٥٣ <sup>abc</sup>	VCO+CLA %١,٥	٣,٠٥±١٠٥,٢٠ <sup>c</sup>	CLA %١
١١,٣٧±١٠٣,٣٢ <sup>c</sup>	VCO+CLA %٢	٣,٣٧±١١٢,٢٨ <sup>ab</sup>	CLA %١,٥
٤,٧٧±١٢٩,٩٥ <sup>a</sup>	%٤ VCO	٦,٤٩±١٠٨,٢٨ <sup>bc</sup>	CLA %٢

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: CLA\*

: VCO \*\*

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Yamasaki et al. (2003)

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Nevin and Rajamohan, (2008)

Nevin and

.( ) Rajamohan,2008

(St-Onge

(MCFs) .et al., 2003)

(MCFs)

(Thermogenesis) MCFs

.(Dulloo et al., 1995; Noguchi et al., 2002)

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Kloss et al. (2005)

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.CLA

/ Hormone-sensitive Lipase

.(Park et al., 1997)

. TNF- $\alpha$

.(Kloss et al., 2005) ( )

Cooper et al. (2008)

. Cooper et al.,2008

Zhou et al. (2008)

.Zhou et al. (2008)

Hargrave et al. (2005)

Hargrave et al.

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(2005)

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VCO+CLA VCO+CLA ،

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VCO+CLA

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التركيزات					مجموعات التجربة
الهرمون المحفز للغدة الدرقية ( $\mu\text{IU/ml}$ )	الثلاثي أيودوثيرونين (ng/ml)	الثيروكسين ( $\mu\text{g/dl}$ )	الأنسولين ( $\mu\text{U/ml}$ )	اللبتين (ngm/ml)	
$0.02 \pm 0.17^a$	$0.02 \pm 0.39^d$	$0.46 \pm 4.17^d$	$0.06 \pm 3.85^{bc}$	$0.22 \pm 2.57^h$	الضابطة
$0.02 \pm 0.14^{ab}$	$0.02 \pm 0.58^{bc}$	$0.29 \pm 0.61^{bc}$	$0.94 \pm 0.57^b$	$0.16 \pm 4.33^{fg}$	CLA * % 0.5
$0.03 \pm 0.13^{abc}$	$0.03 \pm 0.61^{bc}$	$0.14 \pm 6.07^{abc}$	$0.69 \pm 6.18^b$	$0.42 \pm 7.66^c$	CLA % 1
$0.02 \pm 0.11^{bcd}$	$0.05 \pm 0.44^d$	$0.17 \pm 0.03^{cd}$	$0.13 \pm 1.71^c$	$0.73 \pm 13.70^a$	CLA % 1.5
$0.03 \pm 0.10^{cd}$	$0.06 \pm 0.57^{bc}$	$0.27 \pm 0.74^{bc}$	$0.52 \pm 3.83^{bc}$	$0.55 \pm 9.38^b$	CLA % 2
$0.01 \pm 0.09^d$	$0.04 \pm 0.72^{ab}$	$0.67 \pm 7.20^a$	$0.49 \pm 0.07^b$	$0.17 \pm 6.87^{cd}$	% 0.5 VCO**+CLA
$0.01 \pm 0.02^e$	$0.05 \pm 0.58^{bc}$	$0.49 \pm 6.79^{ab}$	$0.19 \pm 4.50^b$	$0.18 \pm 0.96^{de}$	% 1 VCO+CLA
$0.001 \pm 0.02^e$	$0.03 \pm 0.60^{bc}$	$0.29 \pm 6.34^{ab}$	$1.23 \pm 4.12^{bc}$	$0.14 \pm 0.19^{ef}$	% 1.5 VCO+CLA
$0.003 \pm 0.01^e$	$0.07 \pm 0.47^{cd}$	$0.36 \pm 6.27^{abc}$	$0.82 \pm 9.36^a$	$0.21 \pm 4.09^g$	% 2 VCO+CLA
$0.0002 \pm 0.001^e$	$0.04 \pm 0.79^a$	$0.29 \pm 6.45^{ab}$	$1.31 \pm 9.65^a$	$0.21 \pm 2.46^h$	% 4 VCO

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: CLA \*

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(CLA , ) CLA ,  
 ( / , ± , ) (CLA , )  
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CLA % CLA % ،

VCO+CLA ، VCO+CLA )

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(r =

(r = 0.118, p = 0.193)

.0.034, p = 0.402)

(r

(r = 0.063, p = 0.32)

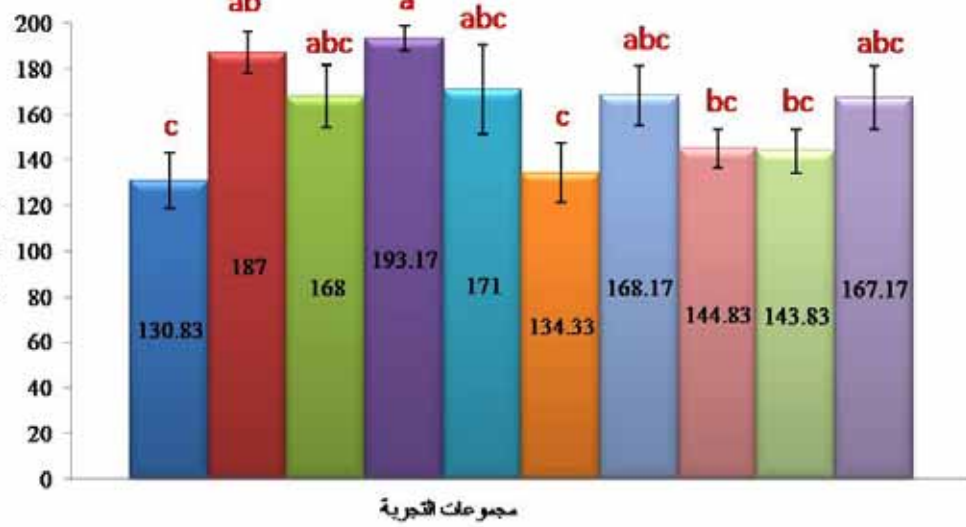
.= 0.046, p = 0.369)

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(VCO+CLA)

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متوسط تركيز الجلوكوز  
(ملغم/دسلي)



control 0.5%CLA 1%CLA 1.5%CLA 2%CLA  
0.5%CLA+VCO 1%CLA+VCO 1.5%CLA+VCO 2%CLA+VCO 4%VCO

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( ) CLA ,

( / ± , )

( $r = 0.30$ ,  $p = 0.012$ )

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(r =

.(r = -0.52, p = 0.000)

0.30, p = 0.012)

(Simón et al., 2006)

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Simón et al.

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(2006)

Simón et al. (2006)

Simón et al. (2006)

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(Halaas

et al., 1995; Lonnqvist et al., 1995)

.(Considine et al., 1996; Maffei et al., 1995)

Akahoshi et al. (2003)

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( / , ± , ) CLA ,

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Brown et al. (2004)



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(differentiated) ( )

Simón et al. (2006)

.(Belury, 2002; Park et al., 1999a)

( ) [Tumor Necrosis Factor-alpha (TNF- $\alpha$ )]

(Hotamisligil, 1999)

TNF- $\alpha$

.(Tsuboyama-Kasaoka et al., 2000)

TNF- $\alpha$

Corino et al. (2002)

[Peroxisome Proliferator Activated Receptor (PPAR-  $\gamma$ ) ]

(Moya-Camarena et al., 1999)

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(Ryder et al., 2001) (PPAR-  $\gamma$ )

(Heshka and

(Reseland et al., 2001)

.Jones, 2001)

Pérez-Matute et

al. (2007)

Pérez –Matute et al.

(*in vivo*)

-(in vitro)

-(Ahn et al., 2006; Choi et al., 2000; Rodriguez et al., 2002)

Rahman et al. (2001)

Rahman et al.

(Soy (Safflower) (2001)  
oil)

OLETF

Wister-albino

.Rahman et al. (2001)

-, -, , -, , Rahman et al. (2001)  
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Rahman et al.

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Yamasaki et al. (2003)

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Zhou et al. (2008)

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( ) Zhou et al.(2008)

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(PPAR- $\gamma$ , TNF-  $\alpha$ )

Ahn, I. S.; Choi, B. H.; Ha, J. H.; Byun, J. M.; Shin, H. G.; Park, K. Y. and Do, M. S. (2006). Isomer-specific effect of conjugated linoleic acid on inflammatory adipokines associated with fat accumulation in 3T3-L1 adipocytes. *J. Med. Food.* 9(3):307-312.

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## Comparative Study of the Effect of Conjugated Linoleic Acid and the Virgin Coconut Oil on Weight Management Hormones in Rats

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**ABSTRACT:** The purpose of this study was to evaluate the effect of conjugated linoleic acid (CLA), virgin coconut oil (VCO) and their mixtures on weight management hormones (leptin, insulin and thyroid hormones). Sixty male Wister-albino rats (eight weeks old and weight  $110 \pm 10$  g) were randomly assigned to ten groups of six rats in each one. The first group was fed a control diet. Four groups were fed different concentrations (0.5, 1.0, 1.5 and 2.0%) of CLA, the other four groups were fed different concentrations of CLA (0.5, 1.0, 1.5 and 2.0%) plus VCO and the last group was fed VCO alone.

Results revealed significant ( $P < 0.05$ ) increase in leptin hormone in the serum of rats fed the different concentrations of CLA as alone or as a mixture with VCO compared to the control group and the increase was less with the mixture compared with CLA alone. However, no significant difference in leptin concentration in rat serum was noticed between the control group and the group fed VCO alone. Serum insulin was also increased significantly in groups of rats fed VCO+ 2% CLA and VCO alone compared to the control group. Thyroxin (T4) and triiodothyronin (T3) were significantly increased ( $P < 0.05$ ) in serum of rats fed the different concentrations of CLA, VCO and their mixtures and the highest increase was in the groups fed VCO alone compared to the control group. This increase was accompanied by significant decrease ( $P < 0.05$ ) in serum concentration of the thyroid-stimulating hormone of rats fed 1.5% or higher of CLA and the mixture of this acid with VCO compared to the control group. The most decrease in this hormone was noticed in the serum of rats fed VCO alone except in groups fed 1.0% CLA and 2.0% CLA + VCO compared to control group and group fed VCO alone. In general, CLA and VCO and their mixtures had no effect in the serum glucose of the rats. Moreover, weight of the rats was not affected by CLA and VCO or their mixtures except a significant decrease of the weight of rats fed 2.0% CLA+ VCO compared to the control group.