



1. 가 . Crouse
(13)
가 LDL- 가
(12). 가

(3-6). LDL- 가 (14- 16) (17)
(phytoetrogen) 가 가
(3). 가

가
(diethylstilbestrol)
(hexestrol) (7). 가

(8- 12). 가 3
(,)
61% (3).)

LDL- (3)가 가 -), 80mg (+)
 ; 1) 12 12 42g/day 가 가
 42g/day 가 , 1997 6 1998 4
 2) 4 2 , 9
 LDL- 11 . 30 가 가
 (18-25) 가 , ,

2.

2.3.

2.1.

(21g / × 2 /).
 Protein Technologies Inc. (1).
 , 80 , 가 20-31
 3
 , 10
 , 705 235
 145
 가 3.37-4.92 mmol/L
 (130- 190mg/ dL), 2.82mmol/L
 (250mg/ dL) . 145
 115 (kJ)² 1200 1200 1200 1200

2.2.

14 , double-blind, (mg/ day) 500 500 500 500
 placebo-controlled

4 가

¹ Protein Technologies Inc. St Louis
² kcal 4.184

1kg 가 가
 가 (-4), (0),
 (4), (12)
 30g 500
 mg calcium phosphate 가 2
 2 가
 240ml 가 가
 가 3
 FOOD
 2.4. PROCESSOR
 (26)
 가 6 12
 가 EDTA가 2 4 , 1500 ×g
 (300kcal) 40g, 1200kJ 가 30 가 -70
 가
 가 (27,28). HDL- dextran- sulfat
 -magnesium
 (27). LDL-
 가 90%가 가 4.52mmol/L(400mg/dL) Friedewald 가
 (30) 가
 4 가 3 0, + 2 가
 가
 Anderson Goebelsmann(31)
 2.5. Diagnostic Product Co.
 11
 가 4

2.6.

, 12 LDL-
 10% . LDL-
 0.47 mmol/L
 0.05
 30
 SAS(ver. 8.0)
 가 ±SD
 3 ANOVA가 t-test
 가
 2
 ANCOVA (ANCOVA) t-test
 3
 0.05

3.1.

,
 4
 12
 0.5 ± 1.5, - 0.6 ±
 1.2, + -0.1 ± 0.9kg
 가
 4
 가
 2
 가
 3 4 가
 (3).

3.

115 가 21 4
 (15) (6)
 6 3
 (,) 3 1
 +
 가
 94
 (0) 3
 +
 - +
 (2).

,
 가
 가
 가
 1200kJ(300kcal)
 C
 가 (3).
 가

2.

	(n=30)	- (n=33)	+ (n=31)
()	57.7 ± 6.0	58.4 ± 7.2	62.6 ± 7.3 ²
() ³	48.1 ± 4.9	49.7 ± 3.7	48.4 ± 5.8
	16.1 ± 2.3	15.7 ± 2.5	15.7 ± 1.8
, (%)	73	69	87
(%)	60	44 ⁴	77
(kg/m ²)	27.1 ± 4.8	25.4 ± 3.6	25.6 ± 4.4
(kJ) ⁵	7575 ± 1510	7070 ± 1675	7070 ± 1590
(%) ⁵	16.7 ± 3.5	17.3 ± 4.2	15.9 ± 2.9
(%) ⁵	51.0 ± 9.0	51.5 ± 10.4	54.0 ± 7.7
(mg/day)	76 ± 305	766 ± 271	674 ± 246
(%)	30.9 ± 8.0	30.0 ± 8.2	29.3 ± 6.6
(%)	9.3 ± 2.8	9.4 ± 3.3	8.0 ± 2.9
(mg/day)	215 ± 122	271 ± 192	182 ± 120
C(mg/day)	146 ± 4.6	139 ± 70	160 ± 63
(g/day)	22.0 ± 8.6	20.3 ± 6.9	22.1 ± 6.4
(g/day)	14.4 ± 4.6	13.7 ± 3.8	13.2 ± 3.4
E(IU/day)	11 ± 5	10 ± 4	11 ± 3
(µg/day)	313 ± 198	293 ± 136	292 ± 121
(mmol/L)	6.2 ± 0.7	6.2 ± 0.9	6.1 ± 0.6
LDL-	4.2 ± 0.6	4.2 ± 0.8	4.0 ± 0.7
HDL-	1.5 ± 0.4	1.4 ± 0.3	1.5 ± 0.4
	1.2 ± 0.6	1.2 ± 0.5	1.3 ± 0.7
(nmol/L)	2.3 ± 0.7	2.3 ± 0.8	2.4 ± 1.1
(pmol/L)	200 ± 48	204 ± 52	215 ± 67
(pmol/L)	29 ± 15	26 ± 14	28 ± 18
(IU/L)	63 ± 25	74 ± 30	62 ± 24

¹ ± SD. kJ kcal 4.184 . mmol/L mg/dL 0.0259 0.0113 .

² , P=0.01.

³ , - , + 7, 4, 5 가 .

⁴ + . P<0.05(²-test = 6.9).

⁵

	() ¹	P
(kJ) ²	-57 ± 97 ³	<0.0001
	11 ± 97	0.3
(g/day)	-14.4 ± 23.4	<0.0001
	27.6 ± 23.4	<0.0001
(g/day)	-17.9 ± 60.6	0.006
	12.1 ± 60.6	0.06
(mg/day)	-152 ± 275	<0.0001
	348 ± 275	<0.0001
(%) ⁴	-6.5 ± 6.9	0.03
(%) ⁴	-2.3 ± 1.1	<0.0001
(mg/day)	-5.8 ± 132	<0.0001
C(mg/day)	25 ± 97	0.01
(g/day)	-2.7 ± 7.9	0.001
(mg/day)	-2.2 ± 4.8	<0.0001
E(IU/day)	-1.1 ± 5.7	0.06
(μg/day)	-19 ± 173	0.3

¹ n=94

² kcal 4.184

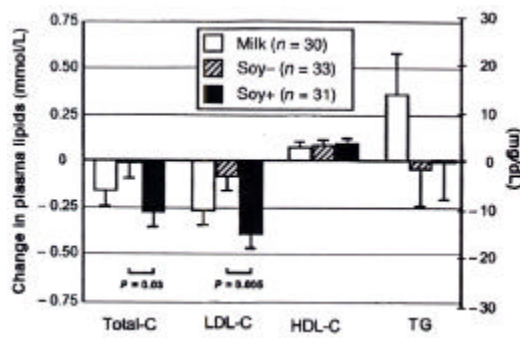
³ ± SD

⁴ 1200kJ/day

35%, + 34%가 blinding

3.2.

4, 12, LDL-가, 가, -0.27mmol/L, LDL-, -0.38mmol/L, LDL-, HDL-, 가, 12, LDL-, (2), -0.18,



1. (),

가, 90%

가 가

55%,

; TG,

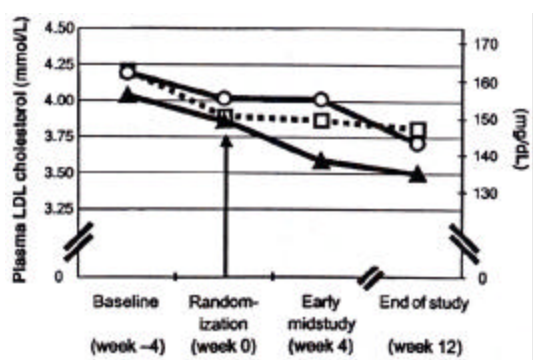
4.

	(n=30)	- (n=33)	+ (n=31)	P ²
<i>nmol/L</i>				
(0)	6.1 ± 0.6	5.9 ± 0.7	5.9 ± 0.6	0.03 ³
(4)	6.1 ± 0.8	5.9 ± 0.8	5.7 ± 0.6	
(12)	5.9 ± 0.7	5.9 ± 0.9	5.7 ± 0.5	
LDL-				
(0)	4.0 ± 0.5	3.9 ± 0.6	3.9 ± 0.6	0.01 ³
(4)	4.0 ± 0.7	3.9 ± 0.7	3.6 ± 0.7	
(12)	3.7 ± 0.6	3.8 ± 0.8	3.5 ± 0.5	
HDL-				
(0)	1.5 ± 0.4	1.4 ± 0.3	1.5 ± 0.3	1.0
(4)	1.5 ± 0.4	1.4 ± 0.2	1.5 ± 0.3	
(12)	1.5 ± 0.4	1.5 ± 0.2	1.6 ± 0.3	
(0)	1.3 ± 0.7	1.3 ± 0.5	1.3 ± 0.8	0.3
(4)	1.2 ± 0.7	1.4 ± 0.6	1.5 ± 0.9	
(12)	1.4 ± 1.0	1.3 ± 0.6	1.3 ± 0.7	

¹ ±SD. mmol/L mg/dL .0 0.0259 0.0113 .

² 12 . 0

³ + 가 pairwise comparison(P=0.03, LDL- P=0.005)



- -0.31, + -0.17mmol/L

16 가 -0.45, -

LDL- -0.39, + -0.53mmol/L 가

2. (, : n=30), 4 0 12 가

(- , ; n=33) 80mg 가

(+ , ; n=31) 4

LDL-

4.

8

LDL-

LDL-

LDL-
가

가

() ,

- +

가

LDL-

. 1995

가

31

가

LDL-

(3). 47g

LDL-

-0.56mmol/L

(95% CI :

0.82, 0.29mmol/L).

31

24

0

95% CI

+

LDL-

LDL-

. 16

가

60%

가

(3)

가

(: -0.39

-0.53mmol/L).

. Baum (14)

LDL-

가

2가

(56 90mg/)

:

0.31mmol/L

; +

4

0.28mmol/L

24

;

8

, 0.27mmol/L

HDL-

(2).

가

. Nestel (15) 80mg
(placebo)

가

가

가

LDL-

casein- lactalbumin

LDL-

2가

casein- lactalbumin

+

가

casein-

12

LDL-

lactalbumin

(17). Sirtori (16)

LDL-

가

,

, estrogen

, Crouse (13)

가

LDL-

(9, 13 33).

, 3, 27, 37,

62mg

LDL-

가 4.8 mmmol/L

LDL-

가

가 가

rhesus

(

)

(11) cynomolgus

(12)

가

LDL-

가

LDL-

가

"LDL-

+VLDL-

"

(5.8- 11.1mmol/L)

가

LDL-

가

(3, 15- 17).

가

LDL-

(

3.4- 4.9mmol/L) 가

가

가

: *Am J Clin Nutri* 2001; 73(728- 735)

가

. Baum

(14)

가

LDL receptor messenger RNA

:

가

가

가

. Nogowski (32)

:
 :
 (),
 (-), 80mg
 (+) 42g/ 12
 : LDL- - (n=33)
 + (n=31) (0.09mmol/L
 0.38mmol/L (P) 0.005),
 (n=30) 0.26mmol/L
 LDL-
 HDL-
 가
 : LDL-
 LDL-
 가
 가

5.

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