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Effects of compound organic acid calcium on growth performance, hepatic antioxidation and intestinal barrier of male broilers under heat stress

Junna He[1], Lianxiang Ma[1], Jialing Qiu[1], Xintao Lu[1], Chuanchuan Hou[1], Bing Liu[1,2], and Dongyou Yu[1,*]

* **Corresponding Author:**
Tel: +86-571-88982107, **Fax:** +86-571-88982107,
E-mail: @

[1] A m
A m
A , 310058,

[2]

214122,

ORCID
:// /0000-0003-1805-2434
:// /0000-0001-7554-9047
:// /0000-0002-3440-7488
:// /0000-0003-0051-8929
:// /0000-0001-6731-5611
B
:// /0000-0003-0451-7341
:// /0000-0002-8350-3126

m A 3, 2019; 11, 2019;
A A 11, 2019

O :
( ) , (32).

M : - -500 50 . 0% ( ), 0.4% 0. % , 6 . 32 ,
.

: , ,
0.4% 0. % 0.4% 0. %
1 21, 22 42 1 42 (0.05).
, 0. % (0.0 3)
42 0.4% (0.05)
. , 0.4%
, 2 -
42 (0.05), - 2 (-2)
-15, (0.05). ,
-1
(0.05). , -
.

C :
, 0.4%.

K :
B B

IN OD C ION

, 1 , 2 , 3 , . , - , , - 4 . 30 , . B

3 . , 5 . - , , , . . , B -

6 , ( ) , , . 10, 11 . , 12 . , - ( )

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A

- - (,). - - -500 45.60 0.5 , 6 50 . , , 0.4% 0. % , . , - B ., (,), 2 1 , 26.45%. - (1 21 - 22 42) 13 - . 1. (50 / , 0.2 0.26 /),

. (+) 15 . B ( ) 32, . 55% 65% (2), . B - .

21 42 , 12 , . , B 14 . - 11 . - - 0 .

G

0 00 21 42 . . , ( ), (/) .

L

- 1 , 2,500 / 15 4 . ( ), - ( ), ( ), (-), (-), (-) , ( ), ( ) - . B (,).

NA -

- - . . 0 - . (, ,). ( ) 1 - - (,). - ( ), B (,) B 500 - (B , , ,).

30 5 , 40 5 5 , ., , ,), -
34 / 60 , 20.0 (., ,
. ,) ' 16 .
3. 2 -
. , , . 0.05
, , . 0.05 0.10.

- 15 .

E L
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2003 (

4. 1 21 ,
0.4% 0. %
7.22% 6.13% (0.05) , /
3.47% 4.05% (0.05)
. 22 42 , 0.4% 0. %

Table 3. m m

Gene	Primer sequence 5'-3'
-2	A AAA AA
	A AA A A
	A A A A AAA AA
	A AA A
1	A A A
	AA AAA A A
3	AA A AAA
	A A
2	A A
	A A A
-	A AA
	A A AA
4	AA A A A A
	A A A AA A AA
15	AA
	A A A
-1	A A AA A AA
	A A AA A A
	A A A
	A A A A A A
- 2	A A A A A
	AA AA

-2, m 2; - 2, m- - 2.

L

21 42 5. - (21) (p < 0.05). , 0.4% 0. % 42 (0.05). - , - , - , (21) (p < 0.05), 0.4% 0. % 42 (0.0 3).

2 (C-2), - ( ), 1 (1), 3 (3) - 2 (- 2) 1. , 21, 3 - 2 0. % (0.05), (p < 0.05) , 1 (p < 0.05). 42, 0.4% (0.05) C-2

Table 4. m m m

Items	21 days of age[1]			SEM	p-value
	Control	0.4% COAC	0.8% COAC		
B ( )					
1	45.80	45.19	45.40	0.35	0.52
21	563.45	600.15	594.71	9.91	0.04
42	1,498.89	1,608.86	1,603.45	35.31	0.01
1 21					
A ( )	42.68	44.02	43.43	0.74	0.50
A ( )	24.65	26.43	26.16	0.48	0.04
	1.73	1.67	1.66	0.01	0.01
22 42					
A ( )	93.43	95.59	95.98	1.62	0.55
A ( )	44.54	48.03	48.04	1.51	0.02
	2.10	1.99	2.00	0.04	0.01
1 42					
A ( )	67.99	69.77	69.71	0.95	0.37
A ( )	34.60	37.23	37.10	0.85	0.01
	1.97	1.87	1.88	0.03	0.02

m (= 6).
A , m m; m 6 ; A , ; A , ;
1) = ; 0.4% A = + 0.4% m m; 0.8% A = + 0.8% m
m.
m (< 0.05).

- *2* , , 0. % (0.05) *1* - *2* .

C-2, , *1*, *3*, - *2* 2. 21, *3* (0.05) 0.4% .. 0.4% , 0. % *3* *C-2* (0.05). 42, 0.4% (0.05) *1* 0. % .

3. - ( ), ( ) - 1 (*-1*) .. , 21, 0.4% (0.05) *-2* , 0. % (0.05) . 42, 0.4% - *15* (0.05), (_ 0.05).

4, 21, , 0.4% *-15* (0.05). 42, 0. % (0.05) . *-2*, *-4*, *-1* (_ 0.05).

DI C ION

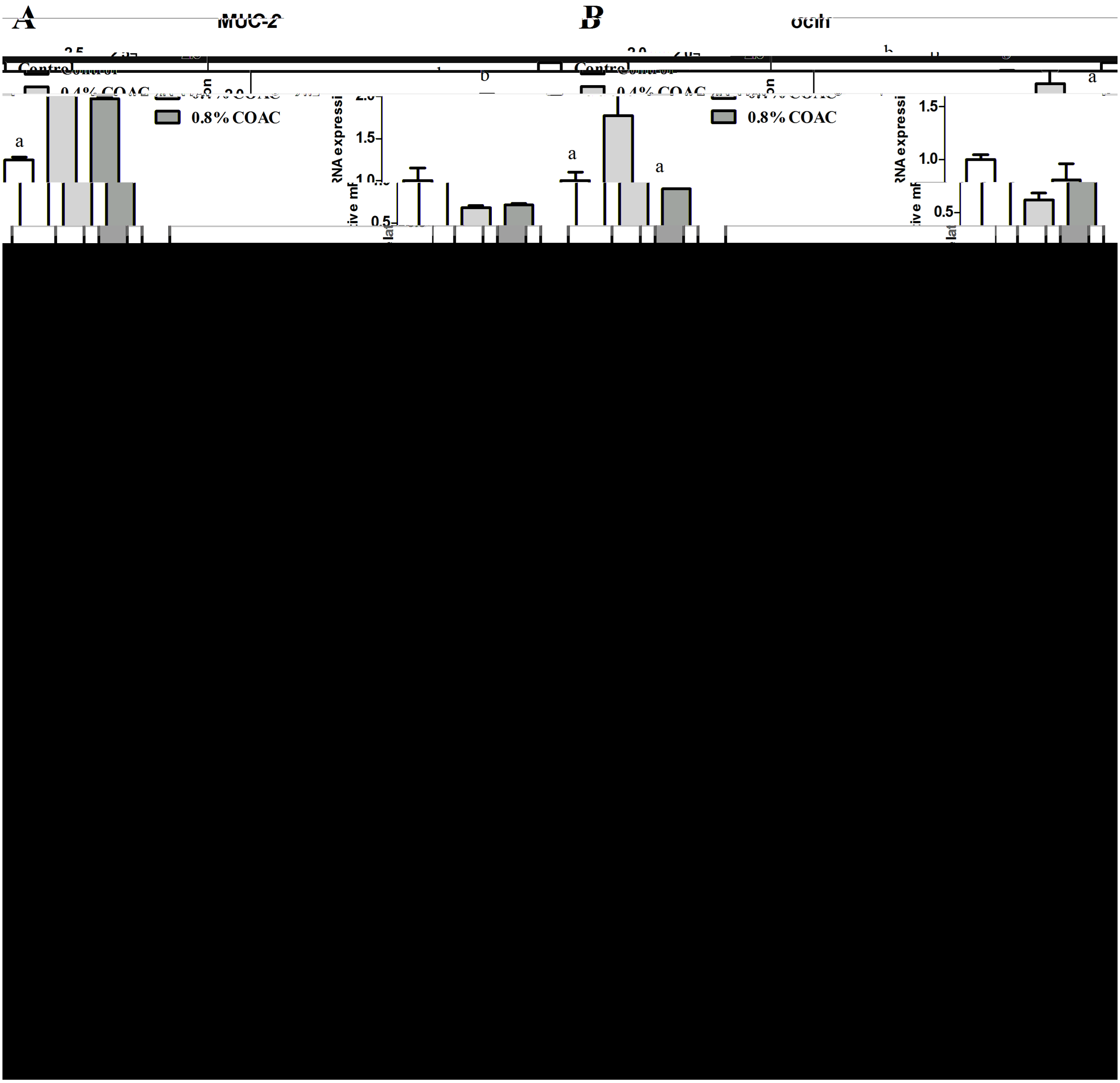

Figure 1. -2, 1, 3 -2 A .A 21 42 , -2 (A), (B), 1 ( ), 3 ( ) -2 ( ) -2, 2; ; , ; -2, -2. (-) (<0.05).

24 . , , , 27, , - , . 25 . 2 . , , , , 25 , - 21. 5 . 0.4%. , . , 26 . - . - , - , - , -

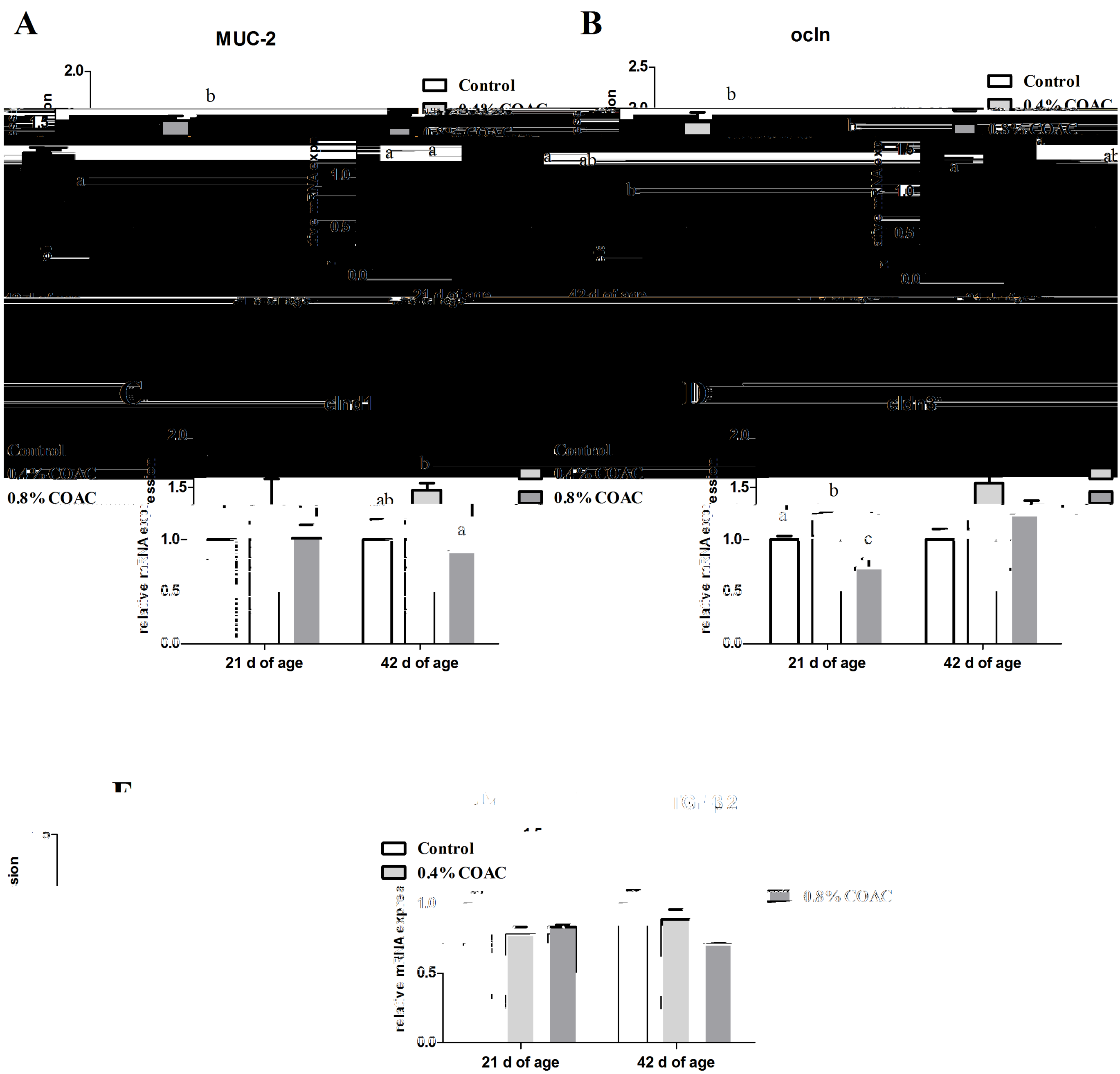

Figure 2. m . , 1, 3 -2 m A m . A 21 42 , (A), 1 (B), 3 ( ) -2 ( ) m - m m . , ; , ; -2, m . - 2. (-) (<0.05).

- . 2 . - - , - , - 15 , , (21) , - 31 . 0.4% 0. %. , , 2 30 - 32 . ,

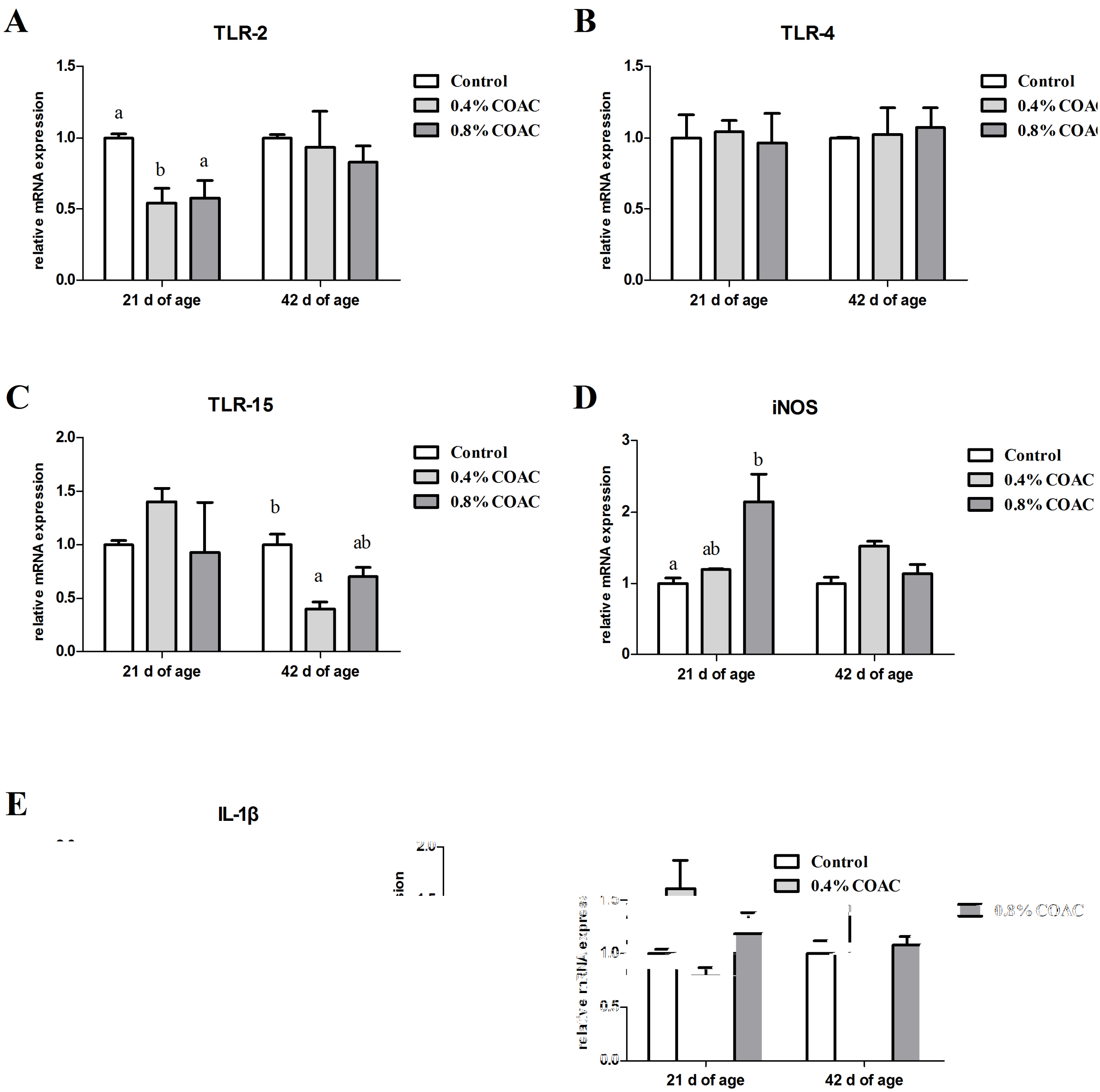

Figure 3. ... -1 ... -2 (A), -4 (B), -15 ( ), ( ) -1 ( ) ... 21 ... 42 ... -1 ... 1 ... (,) ... (<0.05).

... 15 ... 34 ...

... C-2, ...

... 33 ...

... 0.4% ...

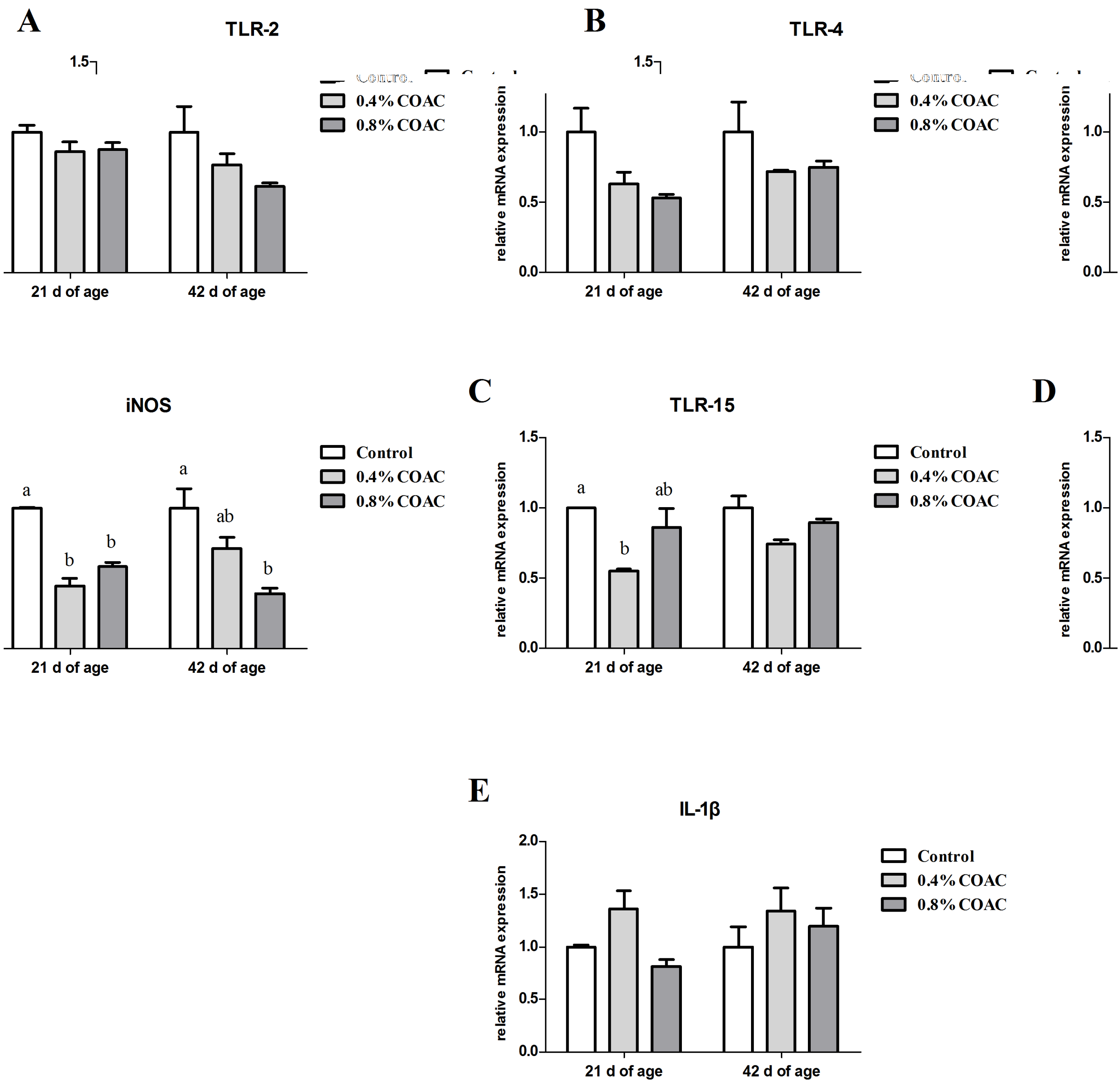

Figure 4. ... -1 ... A 21 42 ... -2 (A), -4 (B), -15 ( ), ( ), -1 ( ) ... (<0.05).

... 35 ... 2 ... 4 ... 36 ... -1 ... -2, -15 ... 37.

CONCL[illegible]ION

... -2, -4, C-2 ...

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