



PSVI-24

Growth performance and immune responses of weaned pigs from lactating sows fed dietary spray dried plasma

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Abstract

Introduction

Objective

Materials & Methods

Results

Conclusion

Abstract

The experiment was conducted to investigate growth performance and immune responses of weaned pigs from lactating sows fed dietary spray dried plasma (**SDP**). A total of 12 sows (227.78 ± 7.50 kg BW; parity = 2.0 ± 0.7) were randomly assigned to 2 dietary treatments in a completely randomized design. Dietary treatments were a typical lactation diet based on corn-soybean meal (**CON**) and CON supplemented with 1% of SDP (**SDP**). Sows were fed the dietary treatments from d 30 before expected farrowing to weaning. Weaned pigs from each sow were transferred to a nursery barn and group-housed by dietary treatments of sows and fed a typical nursery diet for 6 wk. Blood samples were collected from randomly selected 2 weaned pigs from each litter on day of weaning day, d 3, and 7 postweaning. Serum tumor necrosis factor- α (**TNF- α**), transforming growth factor- β (**TGF- β**), C-reactive protein (**CRP**), and cortisol were analyzed by the enzyme-linked immunosorbent assay. Body weights and feed allowance were recorded throughout post-weaning period to calculate growth performance of weaned pigs. Data were analyzed using the PROC GLM of SAS. Weaned pigs from lactating sows fed SDP tended ($P < 0.10$) to have increase ADG (470.47 vs. 414.52 g/d) during overall experimental period than pigs from lactating sows fed CON. Supplementation of SDP tended ($P < 0.10$) to decrease serum TNF- α on d 3 (344.11 vs. 449.80 pg/ml) and CRP on d 7 (78.41 vs. 112.28 ng/ml) compared with the piglets from lactating sows fed CON. The addition of SDP also reduced ($P < 0.05$) serum cortisol on d 3 (1.40 vs. 1.88 ng/ml) and TGF- β on d 7 (718.33 vs. 836.48 pg/ml) compared with CON. In conclusion, addition of dietary spray dried plasma in lactation diets may enhance growth performance and modulate immune responses of weaned pigs.



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Abstract

Introduction

Materials & Methods

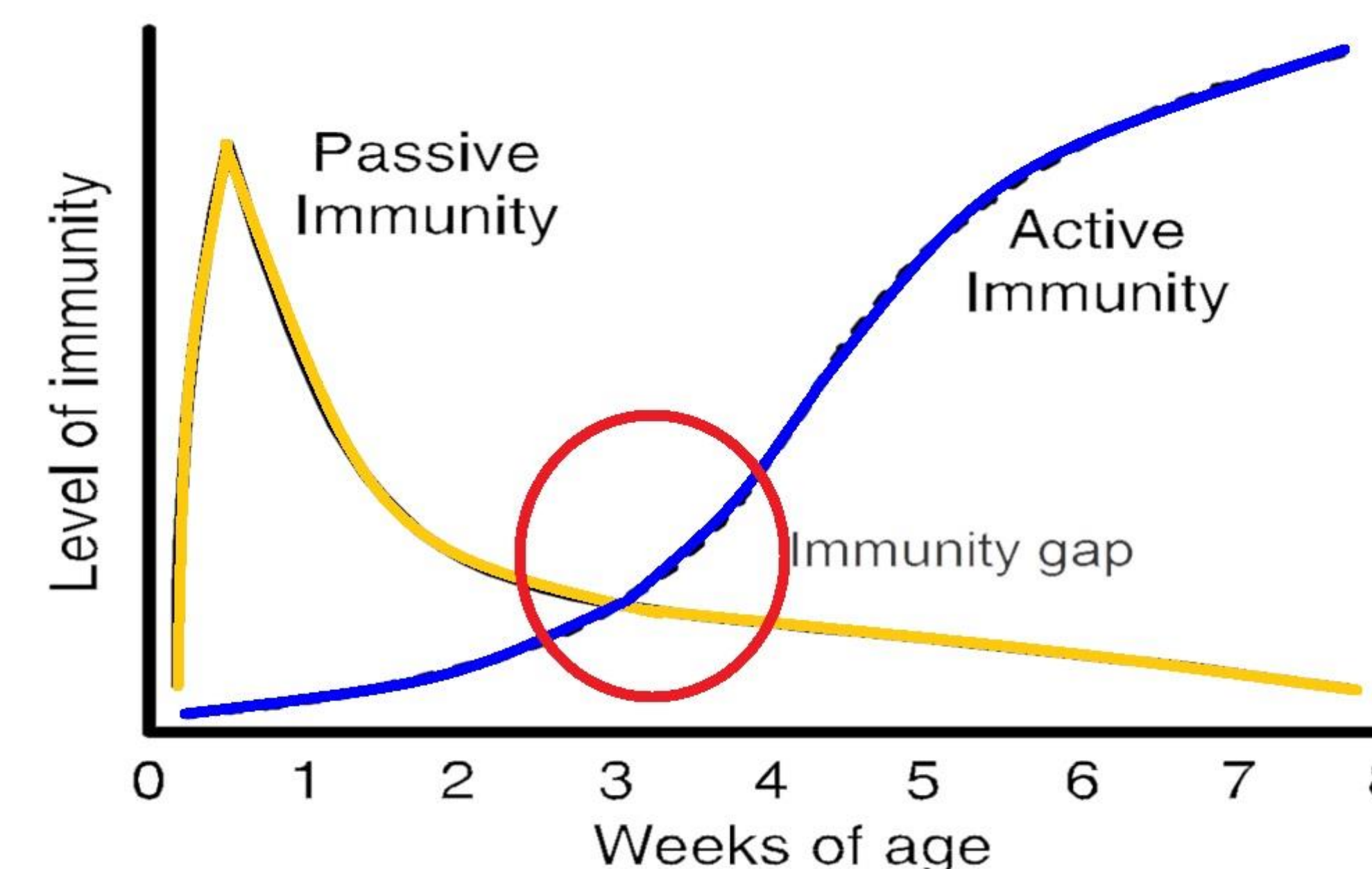
Growth performance

Immune responses

Conclusion

Introduction

- ❖ Immature immune system of weaned pigs
 - ✓ Change in adaptive immunity: immunity gap
- ❖ Spray dried plasma
 - ✓ Modulation gut microbiota and host immune responses
 - ✓ High bioavailable source: essential amino acids, minerals
 - ✓ Various physiological components
 - : immunoglobulins, peptides, glycoproteins, unknown growth factors
- ❖ Beneficial to sows
 - ✓ Improvement of reproductive performance: BW change, litters size & growth
- ❖ Objective
 - ✓ To investigate growth performance and immune responses of weaned pigs from lactating sows fed dietary spray dried plasma.





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Materials & Methods

- ❖ Experimental design: completely randomized design
- ❖ Animals: 12 sows (227 ± 1.64 kg BW; 2.0 parity) and their litters
- ❖ Dietary treatments: sows
 - ✓ Corn and soybean meal basal diet (CON)
 - ✓ CON + 1% spray dried plasma (SDP)
- ❖ Weaned pigs
 - ✓ Group housed by dietary treatments of sows
 - ✓ One nursery diet (ME 3,400 kcal/kg, CP 20.5%)
- ❖ Experimental period
 - ✓ d 30 before farrowing until weaning (58 days)
 - ✓ Piglets were tracked until 6 wk post weaning
- ❖ Measurements for weaned pigs
 - ✓ Growth performance: ADG, ADFI, G:F
 - ✓ Immune responses: TNF- α , TGF- β 1, CRP, cortisol
- ❖ Statistical analysis: PROC GLM procedure of SAS
 - ✓ Experimental unit: pen
 - ✓ Model: dietary treatment for sows

Item	Gestation		Lactation	
	CON	SDP	CON	SDP
Ingredients, %				
Corn	75.82	76.72	65.54	66.53
SBM, 45%	21.30	19.40	31.81	29.82
Spray dried plasma	-	1.00	-	1.00
Others ¹	2.88	2.88	2.65	2.65
Calculated values				
ME, kcal/kg	3,320	3,320	3,430	3,430
CP, %	15.86	15.82	19.76	19.72
Crude fiber, %	2.97	3.00	3.33	3.36
NDF, %	8.71	8.78	10.78	10.81
ADF, %	4.18	4.20	4.63	4.65
Ca, %	0.77	0.77	0.75	0.75
P, %	0.64	0.64	0.65	0.65

Others¹: limestone, mono-dicalcium phosphate, and vit-min premix



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Fig 1. Average daily gain

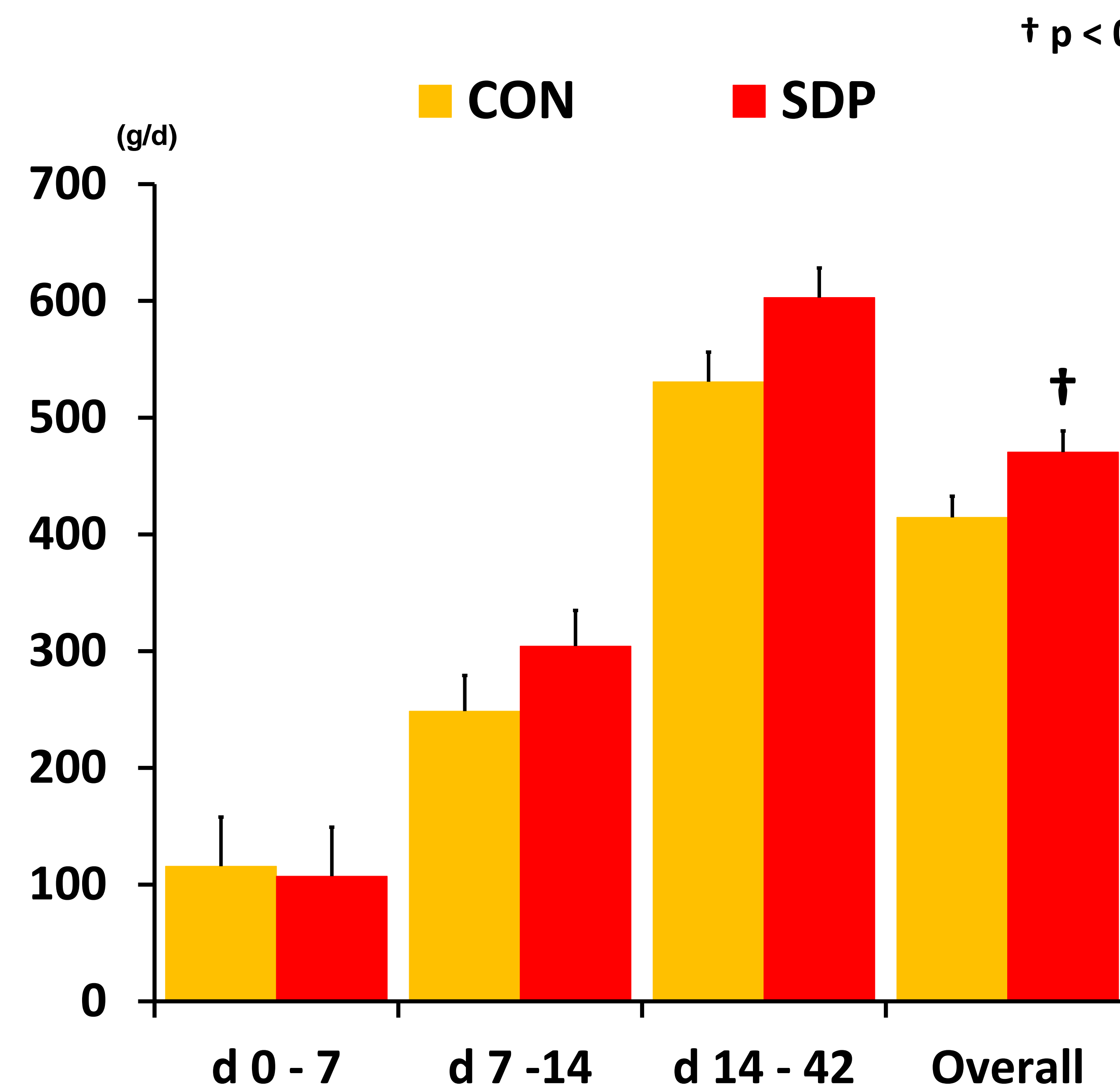
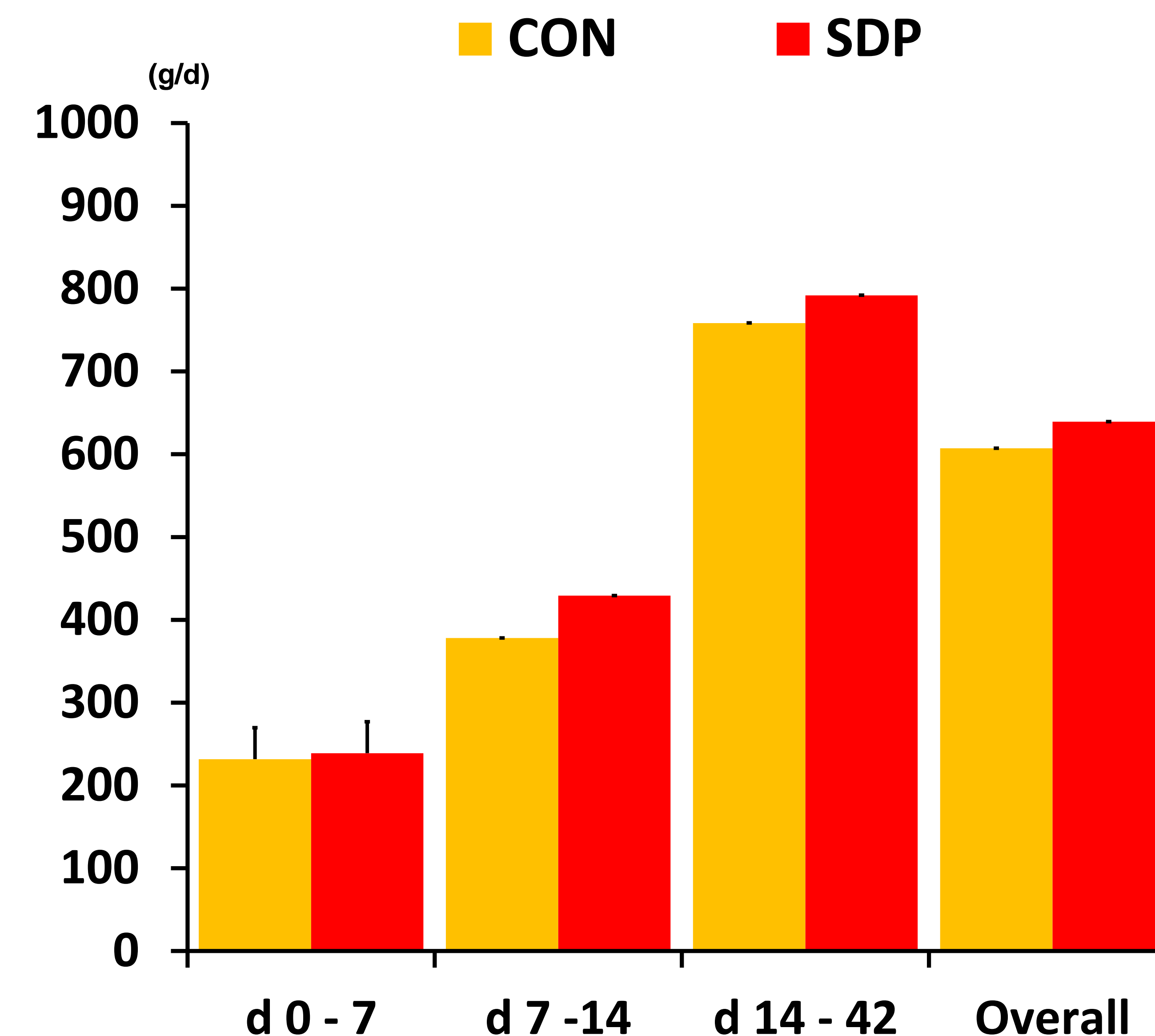


Fig 2. Average daily feed intake





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Fig 3. TNF- α ¹

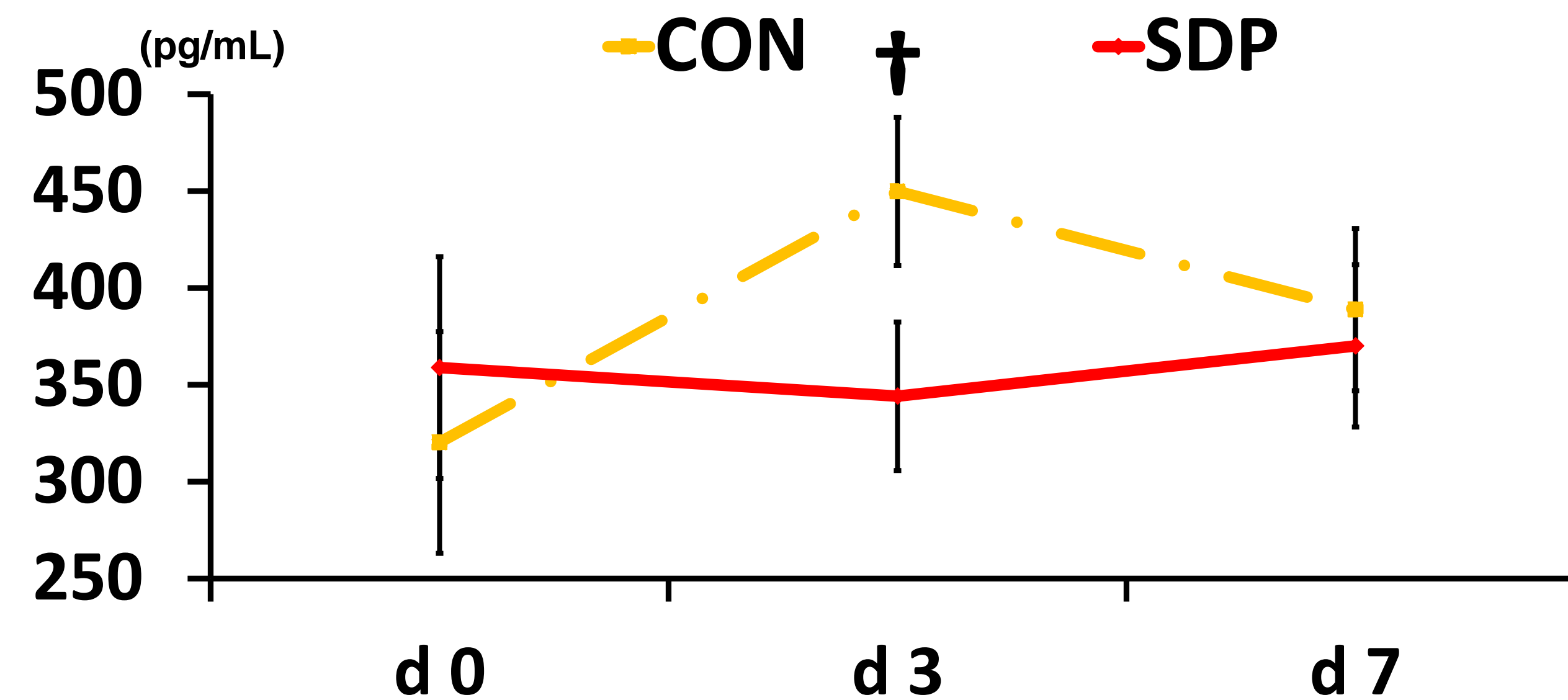


Fig 4. CRP²

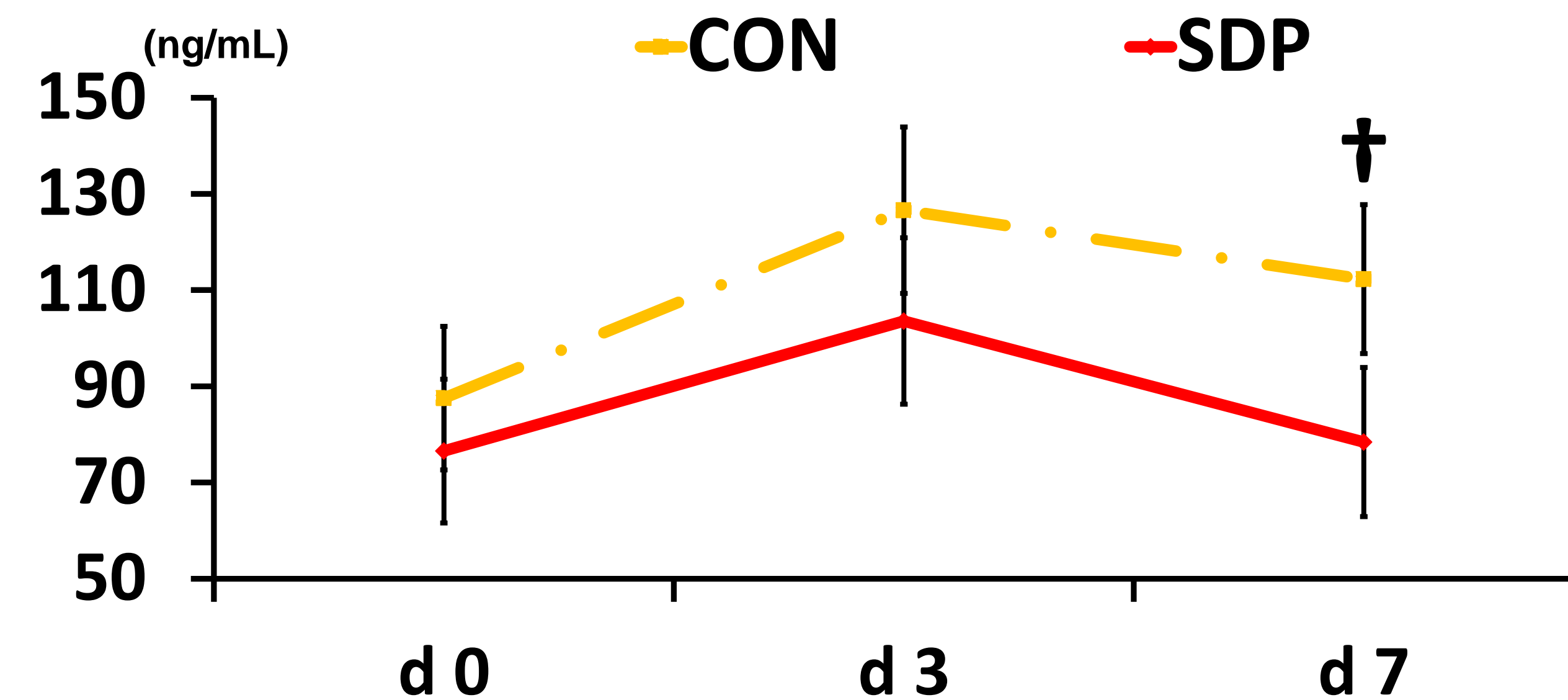


Fig 5. TGF- β 1³

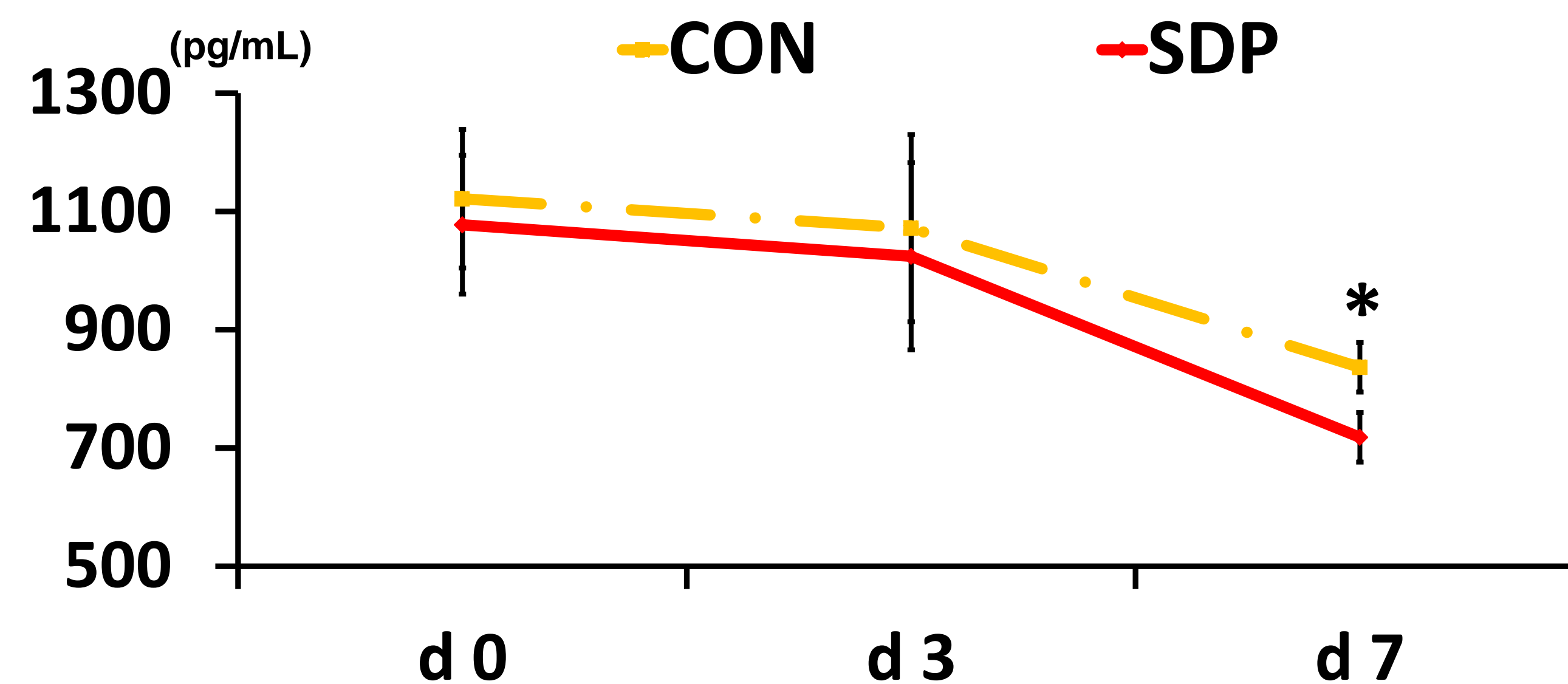
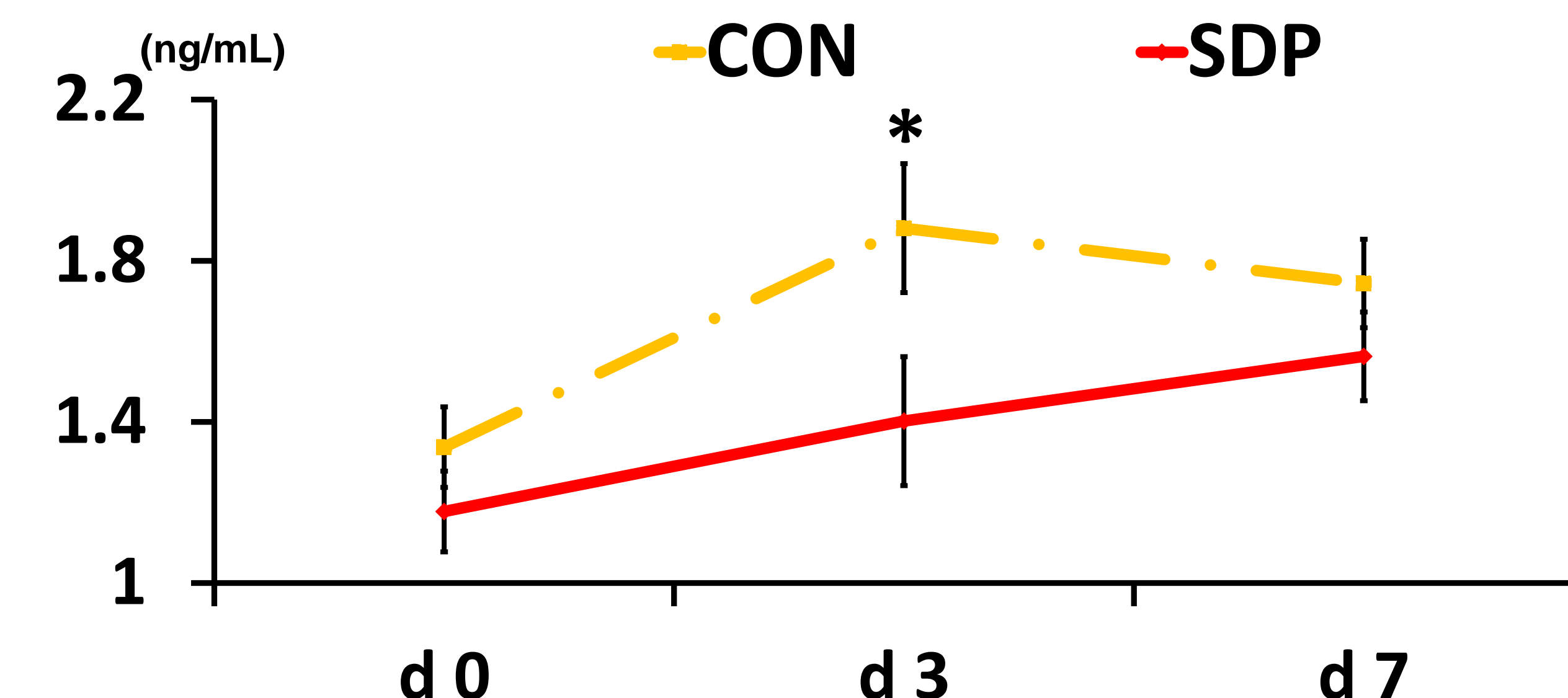


Fig 6. Cortisol



† p < 0.1
* p < 0.05

¹TNF- α : tumor necrosis factor- α , ²CRP: C-reactive protein, ³TGF- β 1: transforming growth factor- β 1



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- ❖ Addition of dietary spray dried plasma in late gestating and lactating diets may enhance growth performance and modulate systemic immune responses of weaned pigs.
- ❖ More results in this experiment are presented in Abstract PSIV-19 (Dietary spray dried plasma on immune responses of lactating sows and their litters).

Acknowledgement

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