Natural or synthetic vitamin E supplementation of lactating sows on fatty acid profile of colostrum and milk

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INTRODUCTION

Most of the vitamin E provided to the neonatal pig is by colostrum and milk (Mahan et al., 1991) since there is a low placental transfer of α-tocopherol to the developing fetus. The alcohol form of the vitamin E has been shown to be more bioavailable than acetate supplements and given as natural form (RRR-d-α-tocopherol) is accumulated more efficiently than the synthetic (dl-α-tocopherol) (Mahan et al., 2000) which is composed of a mixture of eight stereoisomers. Micellization of vitamin E probably maximize its absorption, but little is known about its oral administration and the possible effects on colostrum or milk composition.

OBJECTIVES

The aim of this work was to study the influence of oral natural vitamin E supplementation (micellised d-α-tocopherol) or the synthetic form (dl-α-tocopheryl acetate) in feed to lactating sows on the α-tocopherol concentration and the fatty acid profile of colostrum and milk at 7 and 28 days of lactation.

MATERIAL AND METHODS

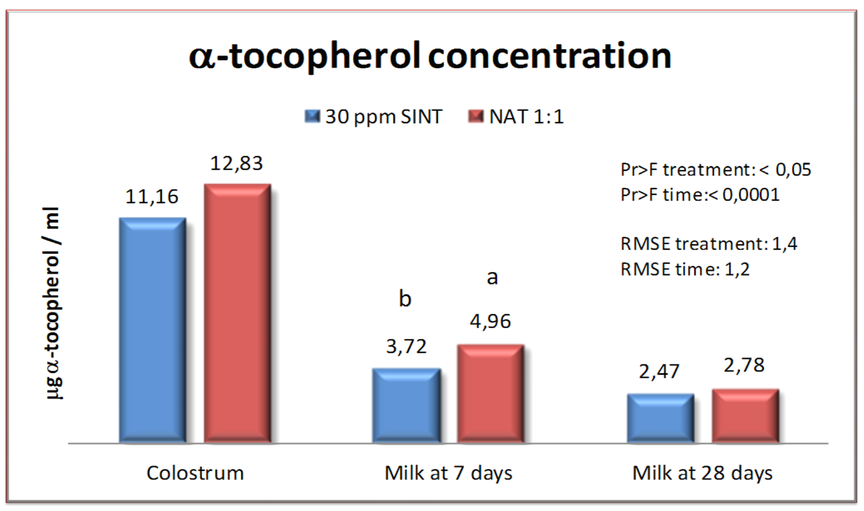
From day 45 of gestation to 28 day of lactation sows (n=24) were divided in two dietary treatments: (1) sows were supplemented with 30 mg dl-α-tocopheryl acetate in feed; (2) sows were supplemented in water with 2,14 ml/day of an emulsion of 70mg/g of RRR–α-tocopherol (H2E-Vitapherole E 7% WS FG, VitaeCaps, S.A., Toledo, Spain). In both treatments the vitamin E intake was 150 mg/day. Colostrum was collected day 1 and milk at 7 and 28 days post-partum by hand-milking.

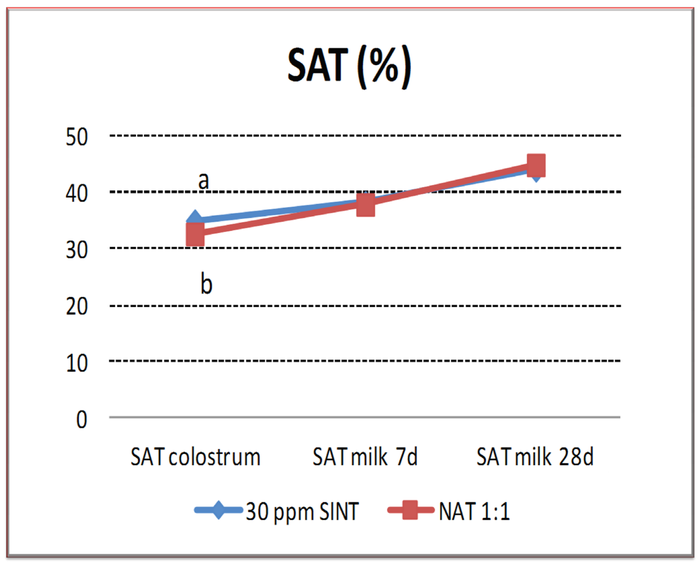
Extraction of α-tocopherol in colostrum and milk samples was carried out by saponification in presence of KCl (1.15%) and KOH (50%) by the modified method of Butriss and Diplock (1984). Analysis of tocopherols were made by reverse phase HPLC (HP 1100, equipped with a DAD and RP-C18 column) (Agilent Technologies, Waldbronn, Germany), the mobile phase was methanol:water (97:3) at 2 ml/min.

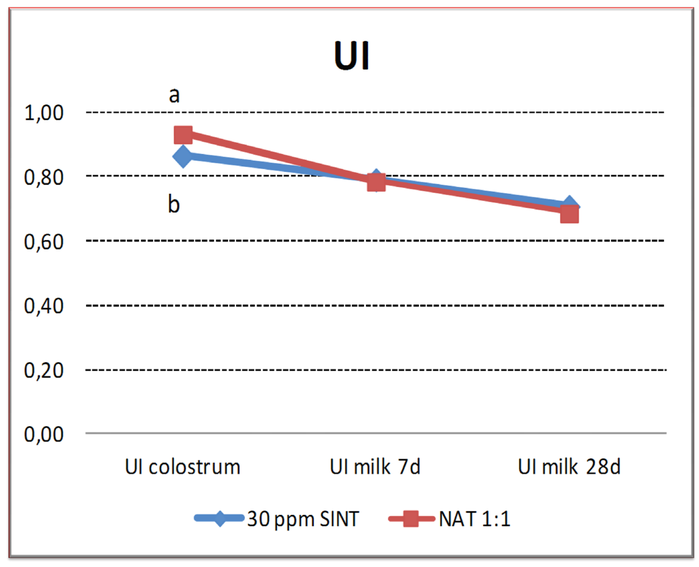
The fatty acid profile of colostrum and milk was determined bv a modification of the method of Sukhija and Palmquist (1988). Quantification was made by gas chromatography.

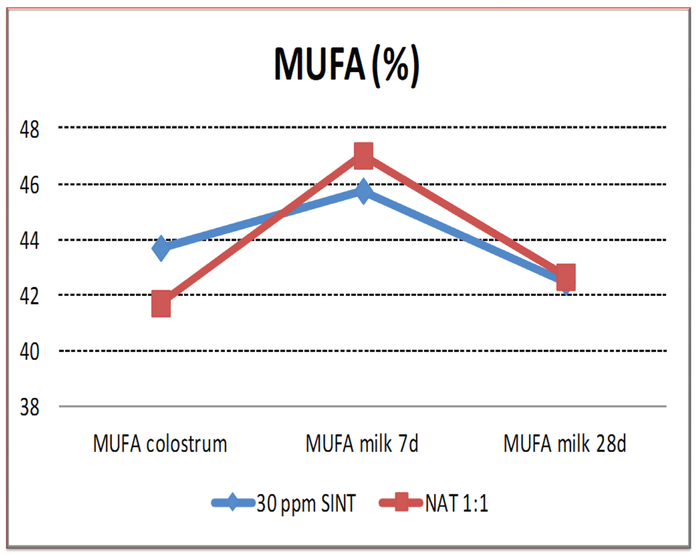
Data were analysed using the general linear model (GLM) procedure (SAS, 1999). A repeated measurement test was used to study time and treatment effects and its interactions. The comparative analysis between means was conducted using the Duncan's test.

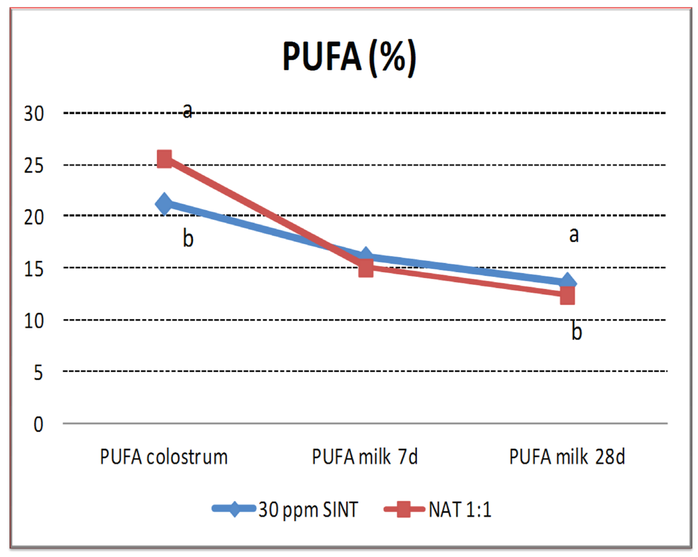
RESULTS











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CONCLUSIONS

- Oral micellised natural vitamin E (d-α-tocopherol) supplementation to sows during gestation and lactation increases the α-tocopherol concentration and modifies the fatty acid proportion of colostrum and milk