

### البحث الثالث

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<b>Title</b>	Role of thyme and celery mixture in improvement of behavior, performance, and immunity of lactating Ossimi ewes at two climate diverse housings.
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### ABSTRACT

Improvement of sheep health and productivity has become a global goal. An effective house must provide adequate space, shelter, and protection from climatic changes and stress. Some plants such as thyme (*Thymus vulgaris*) and celery (*Apium graveolens*) could alleviate stressors. Hence, this investigation was conducted to determine the role of thyme and celery seed mixture (TCM) in improving the behavior and performance of lactating Ossimi ewes at diverse housings during autumn and winter. Forty lactating ewes (2 years old and  $48 \pm 1.5$  kg average body weight) were randomly equally distributed into two semi-shaded buildings (SSB) (20 ewes each). These were roofed with a concrete slab 40 cm thick and 5 m high which was covered with three rows of rice straw bales as thermal insulation. It had natural dirt areas to the north and south. Ten ewes were fed a basal diet, and the others received a basal diet containing TCM (10 gm thyme and 10 gm celery/head/day). Similarly, 20 ewes were treated in a fully-shaded building (FSB) which was roofed with a layer of tin 5 m high and had natural flooring to the west and east. These ewes were fed a basal diet + TCM for 1 month pre-lambing and 2 months post-lambing. Both behavior and weight were recorded bi-weekly. Blood samples were collected monthly to measure oxidative stress indicator reduced glutathione (GSH), malondialdehyde, total protein, glucose, gene expression of nuclear factor 2 linked to erythroid 2 (Nrf2), and interleukin 2. Cumulative feed intake was calculated, and milk samples were collected for 2 months after lambing until weaning to measure moisture, ash, total protein, lactose, non-solid fat (NSF), total solids, fat, and antioxidant capacity of milk (free radical and inhibition factor). The findings revealed that sheep exhibited better feeding behavior in the FSB and the oxidative stress indicator was lower than in the SSB. TCM enhanced feeding behavior and decreased the oxidative stress indicator (reduced GSH) in the SSB. Additionally, it increased total protein and dam body weight (at the 6<sup>th</sup> week) in the FSB and improved feed intake in both buildings. Thyme and celery have antioxidant capacities in milk. Hence, the present data suggest that adding TCM to the basal diet could reduce the stress of climatic changes on lactating ewes and improve animal behavior and immunity leading to enhanced production.