Livestock is a sector that occupies an important place in Senegal. According to the 2013 General Census of Population and Housing, Agriculture and Livestock (RGPHAE) of the National Agency of Statistics and Demography of Senegal (ANSD), the sector of the Livestock occupies 60% of agricultural households and contributes to 4.3% of the country's wealth. It affects the majority of rural families and is now distributed throughout the country, especially in Dakar, which accounts for almost a quarter of the country's total population. This high density of the population is at the origin of the strong demand for meat noted particularly in sheep during Aid El Kebir's holiday. This has resulted in an increase in market prices for sheep, posing the problem of access to sheep by the population despite imports of sheep from Mali and Mauritania. As a result, we are interested in the price dynamics in this sheep market to understand the determining factors behind this rise and its evolution. To do this, we use in this study, the Cobweb model with anticipation by the optimal control approach. This model describes the process by which prices converge to a level of equilibrium that takes into account the variation in data and economic conditions over time. The simulation consisted of assuming an excess of zero demand, ie having the supply equalizing the demand. The results of the optimal control of the model on the monthly sheep price data covering the period 2008-2015 show a long-term stability. This implies that if the control measures carried out by the State are well implemented and effective, prices converge towards a stable long-term equilibrium.

Key words: Modeling, price dynamics, sheep, optimal control, Cobweb model
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