ENVIRONMENTAL CONTROLS ON LAMBING RATE IN PATAGONIA (ARGENTINA): A REGIONAL APPROACH

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ABSTRACT

Sheep herd sustainability in Patagonia is limited by reproductive efficiency. As the herds graze on natural vegetation year round, efficiency is constrained by biophysical factors. Our aim was to characterize the environmental controls over effective lambing rate in northwest Patagonia. We related remotely sensed data [surface temperatures and Normal Difference Vegetation Index (NDVI), a surrogate for forage availability] and climatic information to lambing rates. A spatial model explained 63% of the variability in mean lambing rate, based on mean annual NDVI and mean spring surface temperature. The relative interannual variability in lambing rates was of similar magnitude to that of annual NDVI. Both lambing rate and NDVI were less variable than climatic factors. Two regional temporal models explained approximately 25% of the variability, based on NDVI values representative of ewes' nutrition during late gestation and lambing. These models predicted, with 65 and 76% accuracy respectively, the occurrence of better-thanaverage and worse-than-average yearly lambing rates. These results provided insights into the factors limiting reproduction, and they form the basis for important decision tools for ranch managers. Prediction of lambing rates based on remotely sensed data will reduce the uncertainty and risk in sheep production, increasing the economic sustainability of sheep production.