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## Genomic copy number variations for adaptation of livestock to climate resilience

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### Abstract

Domestications have shaped the genome of all living things on our globe. Changes in temperature and climate were shaped the genetic landscape of the populations. Genomic Copy number variations (CNVs) are shaped using mutation, selection, and demographic history within and between livestock species. Genomic copy number variations play significant roles in designing and implementing genetic intervention plans for climate resilience and improve livestock production in developed and developing countries. For instance, copy number variable genes are olfactory receptors (ORs) important roles for food foraging, mate recognition, and detection of volatile chemicals in the environment. Copy number variations prominent roles surveying unique adaptive, productivity, and survivability traits of African livestock populations display under challenges of environmental pressures, disease, nutritional, and water shortages. Establishing livestock with the appropriate genetics to improve heat resilience in tropical countries and maximise their productivity and subsequently reduce their overall carbon footprint. The individual coat types of domesticated bovine breeds vary widely, with yak breeds (*Bos grunniens*) selected for hair length and cold tolerance, and short-haired cattle of zebu (*Bos indicus*) selected for hot and tropical environments. The improvement of breeds through the transfer of genes into highly selected breeds for better match livestock to harsh conditions and maintain productivity. Phenotype traits to consider for a genetic basis of resilience in all biological functions of interest and the potential inclusion in selection indices for breeding schemes. Therefore, this review focused on genomic copy number variations associated with the adaptation of livestock to climate change, which are appropriate for future scientific knowledge and create strong research, design, and development projects in animal biotechnology to improve heat resilience in Ethiopia to maximise their productivity and subsequently reduce their overall carbon footprint due to the changing climate.

**Keywords:** Association, climate, copy number variation, gene, livestock