

EFFECTS OF HEAT STRESS ON TESTICULAR PHYSIOLOGY IN CATTLE: A REVIEW

Ana Vitória Magalhães de Almeida, Solano Dantas Martins, Sara Jayane Abreu de Souza, Valdevane Rocha Araújo

Undergraduate student in Biomedicine at the Federal University of Delta do Parnaíba (UFDPAR) Parnaíba 64202-020, Brazil

Laboratory of Research in Reproductive physiology (Fisiorep Lab), Parnaíba Delta Federal University (UFDPAR), Parnaíba 64202-020, Brazil

INTRODUCTION & AIM



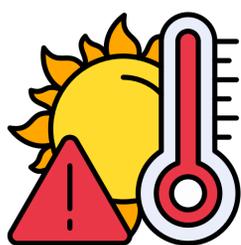
GLOBAL WARMING



INTENSIFIED OF HEAT WAVES



IMPACTING ANIMAL REPRODUCTION



HEAT STRESS AFFECTS MALE

REPRODUCTIVE EFFICIENCY

SPERMATOGENESIS

TO EVALUATE, BASED ON THE SCIENTIFIC LITERATURE, HOW HEAT STRESS COMPROMISES TESTICULAR FUNCTION IN CATTLE.

METHOD

DATABASE



ENGLISH

10 YEARS



ScienceDirect

FULL-TEXT ACCESS

DESCRIPTORS

HEAT-SHOCK RESPONSE, TESTIS, CATTLE, THERMOREGULATION, AND SPERMATOZOA

BOOLEAN OPERATORS: AND, OR

21 STUDIES WERE IDENTIFIED

13 MET THE INCLUSION CRITERIA.

RESULTS & DISCUSSION

INITIAL CHANGES

↑ TESTICULAR TEMPERATURE

ALTERED BLOOD FLOW

IMPAIRED SCROTAL THERMOREGULATION

BIOLOGICAL CONSEQUENCES

OXIDATIVE STRESS

SPERM DNA DAMAGE

EPIGENETIC ALTERATIONS

EFFECTS ON SEMEN QUALITY

SERTOLI AND LEYDIG CELL DYSFUNCTION

↓ SPERM MOTILITY

STRUCTURAL DAMAGE TO SPERMATOZOA

GAO ET AL., 2022

SPERM DNA DAMAGE

PRODUCTION OF ABNORMAL SPERMATOZOA

CAPELA ET AL., 2022

SPERM DNA FRAGMENTATION

LIPID PEROXIDATION

CONCLUSION

THE REVIEWED STUDIES DEMONSTRATE THAT HEAT STRESS REDUCES SPERM QUALITY PARAMETERS AND ALTERS THE MORPHOLOGY AND PHYSIOLOGY OF SEMINIFEROUS TUBULES, ULTIMATELY LEADING TO DECREASED FERTILITY. EVEN MODERATE INCREASES IN TESTICULAR TEMPERATURE ARE SUFFICIENT TO SIGNIFICANTLY COMPROMISE SPERM QUALITY.

FUTURE WORK / REFERENCES

Gao, Y., Wu, J., Wang, Y., Chen, Y., & Li, G. (2022). The effects and molecular mechanism of heat stress on spermatogenesis and the mitigation measures. *Frontiers in Veterinary Science*, 9, 889479. <https://doi.org/10.3389/fvets.2022.889479>

Capela, D., Moreira da Silva, F., & Rodrigues, A. S. (2022). Impact of heat stress on bovine sperm quality and competence. *Animals*, 12(8), 975. <https://doi.org/10.3390/ani12080975>