

ABSTRAK

Perkembangan nanoteknologi memberi dampak terhadap kemungkinan peningkatan kapasitas pengencer konvensional semen sapi melebihi dari kemampuan pengencer komersial. Penelitian ini bertujuan untuk mengkaji perbandingan antara pengencer konvensional, komersial, dan nano serta menentukan jenis pengencer yang dapat menunjukkan kinerja yang lebih baik terhadap motilitas, kinematika, viabilitas, serta abnormalitas semen beku sapi Simmental. Pengencer komersial menggunakan Andromed[®], sedang pengencer konvensional berbahan dasar skim 10% dan kuning telur 5%. Pengencer nano mengandung nano skim 6,66% dan kuning telur 0,5% yang disintesis dengan metode *ball milling*. Sampel semen segar diambil dari 6 ekor sapi Simmental umur 3 tahun menggunakan vagina buatan dengan sub ulangan dua kali, kemudian diencerkan dengan pengencer konvensional (T1), pengencer komersial (T2), dan pengencer nano (T3). Parameter yang diuji adalah motilitas (motilitas total, motilitas progresif, motilitas progresif cepat, motilitas progresif lambat, motilitas progresif sirkuler, motilitas sirkuler lokal, dan motilitas lokal), kinematika (VCL, VSL, VAP, ALH, BCF, STR, LIN, dan WOB), viabilitas, dan abnormalitas. Rancangan yang digunakan adalah Rancangan Acak Lengkap. Data dianalisis dengan ANOVA dan perbedaan antar perlakuan dilanjutkan dengan uji Duncan. Hasil analisis ragam menunjukkan bahwa tidak ada perbedaan yang nyata antar perlakuan ($P>0,05$) terhadap motilitas total, motilitas progresif, motilitas progresif cepat, motilitas progresif sirkuler, motilitas lokal, VCL, VSL, VAP, ALH, WOB, dan viabilitas *post thawing*, kecuali pada motilitas progresif lambat, BCF, LIN, STR, dan abnormalitas menunjukkan berbeda nyata antar perlakuan ($P<0,05$). Hasil penelitian menyimpulkan bahwa jenis pengencer berpengaruh terhadap motilitas, kinematika, viabilitas, dan abnormalitas semen beku sapi Simmental. Pengencer nano menunjukkan kinerja yang lebih baik dibandingkan dengan pengencer konvensional dan pengencer komersial.

Kata kunci: nanopartikel, pengencer, sapi Simmental, semen beku

ABSTRACT

The development of nanotechnology has an impact on the possibility of increasing the capacity of conventional extenders for bovine semen beyond that of commercial extenders. This study aims to compare conventional, commercial, and nano extenders and determine which type of extender can better perform motility, kinematics, viability, and abnormalities of frozen semen of Simmental cattle. The commercial extender uses Andromed®, while the conventional extender is made from 10% skim and 5% egg yolk. The Nano extender contains 6.66% nano skim and 0.5% egg yolk which was synthesized by the wet milling method. Fresh semen samples were taken from six Simmental cows aged three years using an artificial vagina with two sub-replications, then diluted with a conventional extender (T1), commercial extender (T2), and nano extender (T3). Parameters tested were motility (total motility, progressive motility, progressive fast motility, progressive slow motility, progressive circular motility, local circular motility, and local motility), kinematics (VCL, VSL, VAP, ALH, BCF, STR, LIN, and WOB), viability, and abnormality. The design used was Completely Randomized Design. Data were analyzed by ANOVA and differences between treatments were followed by Duncan's test. The results of the analysis of variance showed that there was no significant difference between treatments ($P>0.05$) on total motility, progressive motility, progressive fast motility, progressive circular motility, local motility, and local circular motility, VCL, VSL, VAP, ALH, WOB, and viability after post thawing, except for progressive slow motility, BCF, LIN, STR, and abnormalities showed significant differences between treatments ($P<0.05$). The results of the study concluded that the type of extender affected the motility, kinematics, viability, and abnormalities of frozen semen of Simmental cattle. Nano extender shows better performance compared to conventional extender and commercial extender.

Keywords: extenders, frozen semen, nanoparticles, Simmental cattle