Abstract: It has been reported that plasma serine protease inhibitor (SERPINA5) and dystroglycan (DAG1) are loosely attached to the sperm and SERPINA5 can also be present on sperm tails. The objective of this study was to evaluate whether SERPINA5 and/or DAG1 could be used as a fertility marker in dairy bulls. Frozen semen from dairy bulls (n=19) were evaluated for concentration of SERPINA5 and DAG1 and percentage of sperm tail labeled for SERPINA5 (SERPINA5-tail) by immunofluorescence in a minimum of 200 sperm cells per bull in two different ejaculates. Semen was evaluated for total motility, progressive motility, and viability. Semen was used for in vitro embryo production (~150 oocytes/bull). Bull fertility was classified by two methods, sire conception rates [SCR - High-SCR (>1.0) or Low-SCR (< -4.0)] and the ratio of embryos that developed into a blastocyst (BL) from those that had cleaved (CL) as Good (BL/CL≥38.5%) or Poor (BL/CL< 38.5%). The GLIMMIX procedure of SAS was used to evaluate fertility classification with SCR, BL/CL, and the interaction in the model with bull as a random effect. Progressive motility, CL, SERPINA5 and DAG1 concentration, and SERPINA5-tail did not differ (P≥0.14) among SCR and BL/CL classifications or their interaction. There was no difference (P>0.33) in total motility between High-SCR and Low-SCR or BL/CL classification; however, the interaction was significant (P=0.02; High-SCR/Good 54.9±2.8%, High-SCR/Poor 39.4±5.4%, Low-SCR/Good 44.8±4.5%, Low-SCR/Poor 52.0±3.2%). High-SCR bulls had decreased BL (P=0.03; 30.6±1.6%, 35.8±1.4%, respectively) and tended to have decreased BL/CL ratio (P=0.10; 38.1±2.0%, 42.9±1.8%, respectively) compared with Low-SCR bulls. In summary, DAG1 and SERPINA5 do not seem to be a putative fertility marker. In vitro embryo production is not a good predictor of SCR, since High-SCR and Low-SCR bulls may have Good or Poor in vitro embryo developments.

Keywords: embryo, fertility marker, sperm quality