

เอกสารอ้างอิง

- คมสัน รุ่งเรือง, และอินทอร อีรานูวัฒน์. (2567). การวิเคราะห์ความเสี่ยงเชิงคุณภาพในการนำเข้าโรคบลูทังก์จากการนำเข้าโค กระบือ แพะ และแกะเข้ามาในราชอาณาจักรผ่านทางท่าอากาศยานสุวรรณภูมิระหว่างปี พ.ศ. 2563-2565. **สำนักควบคุม ป้องกันและบำบัดโรคสัตว์ กรมปศุสัตว์ กระทรวงเกษตรและสหกรณ์**. สืบค้นจาก <https://dcontrol.dld.go.th/webnew/index.php/th/news-menu/2018-08-31-02-35-00/8887-2563-2565>.
- จิตศักดิ์ เมืองเขียว, ไชยวรรณ วัฒนจันทร์, และธัญจิรา เทพรัตน์. (2559). ผลของเลซีตินจากเมล็ดทานตะวันระดับต่างๆ ในสารละลายเจือจางต่อคุณภาพน้ำเชื้อแพะแช่แข็ง. **วารสารแก่นเกษตร**. 44(2): 271-278.
- นวรรตน์ บุญทองเนียม. (2566). ข้อมูลเกษตรกรผู้เลี้ยงสัตว์และปศุสัตว์. **ศูนย์เทคโนโลยีสารสนเทศและการสื่อสาร กรมปศุสัตว์ กระทรวงเกษตรและสหกรณ์**. สืบค้นจาก <https://ict.dld.go.th/webnew/index.php/th/service-ict/report/413-report-thailand-livestock/reportservey2566>.
- สมร พรชื่นชูวงศ์, ปราโมทย์ แผงคำ, ธารา วงศ์ดี, และสรศักดิ์ ทองแพะ. (2563). การวิจัยและพัฒนาด้านน้ำเชื้อแช่แข็ง และการผสมเทียมแพะเพื่อสนับสนุนเกษตรกรผู้เลี้ยงแพะในภาคตะวันออกเฉียงเหนือตอนล่าง. มหาวิทยาลัยเทคโนโลยีสุรนารี.
- สมร พรชื่นชูวงศ์, ปราโมทย์ แผงคำ, ธารา วงศ์ดี, และสรศักดิ์ ทองแพะ. (2564). การวิจัยและพัฒนาด้านน้ำเชื้อแช่แข็ง และการผสมเทียมแพะเพื่อสนับสนุนเกษตรกรผู้เลี้ยงแพะในภาคตะวันออกเฉียงเหนือตอนล่าง. มหาวิทยาลัยเทคโนโลยีสุรนารี.
- เสมอ ถาน้อย. (2561). **สเปิร์ม โครงสร้างและความสามารถในการเจริญพันธุ์**. (พิมพ์ครั้งที่ 1). พิษณุโลก:สำนักพิมพ์มหาวิทยาลัยนเรศวร.
- Adekunle, E.O., Iyanda, O.A., Majekodunmi, B.C., Akosile, O.A., Ojo, S.T., Odeyemi, A.J., Logunleko, M., Oderinwale, O.A., Sorongbe, T.A., and Daramola, J.O. (2022). Preservative effects of cysteine on sperm viability of West African dwarf goat bucks chilled at 4°C. **Nigerian Journal of Animal Production**. 49: 49-59.
- Al-Mutary, M.G., Al-Ghadi, M.Q., Ammari, A.A., Al-Himadi, A.R., Al-Jolimeed, A.H., Arafah, M.W., Amran, R.A., Aleissa, M.S., and Swelum, A.A. (2020). Effect of different concentrations of resveratrol on the quality and in vitro fertilizing

- ability of ram semen stored at 5 °C for up to 168 h. **Theriogenology**. 152: 139–146.
- Amaral, S., Da Costa, R., Wübbeling, F., Redmann, K., and Schlatt, S. (2018). Raman micro-spectroscopy analysis of different sperm regions: a species comparison. **Molecular Human Reproduction**. 24(4): 185–202.
- Anghel, A., Zamfirescu, S., Dragomir, C., Nadolu, D., Elena, S., and Florica, B. (2010). The effects of antioxidants on the cytological parameters of cryopreserved buck semen. **Romanian Biotechnological Letters**. 15: 26-32.
- Anothaisinthawee, S., Nomura, K., Oishi, T., and Amano, T. (2010). Goat genetic resources and breeding strategies in Thailand. **The Journal of Animal Genetics**. 38: 41–48.
- Aurich, C., Schreiner, B., Ille, N., Alvarenga, M., and Scarlet, D. (2016). Cytosine methylation of sperm DNA in horse semen after cryopreservation. **Theriogenology**. 86: 1347–1352.
- Benhenia, K., Rahab, H., Smadi, M.A., Benmakhlouf, H., Lamara, A., Idres, T., and Iguer-Ouada, M. (2018). Beneficial and harmful effects of cyclodextrin-vitamin E complex on cryopreserved ram sperm. **Animal Reproduction Science**. 195: 266–273.
- Bhagwat, S., Dalvi, V., Chandrasekhar, D., Matthew, T., Acharya, K., Gajbhiye, R., Kulkarni, V., Sonawane, S., Ghosalkar, M., and Parte, P. (2014). Acetylated α -tubulin is reduced in individuals with poor sperm motility. **Fertility and sterility**. 101(1): 95–104.
- Cao, G., and Cutler, R.G. (1993). High concentrations of antioxidants may not improve defense against oxidative stress. **Archives of Gerontology and Geriatrics**. 17: 189–201.
- Capra, E., Lazzari, B., Turri, F., Cremonesi, P., Portela, A.M.R., Ajmone-Marsan, P., Stella, A., and Pizzi, F. (2019). Epigenetic analysis of high and low motile sperm populations reveals methylation variation in satellite regions within the pericentromeric position and in genes functionally related to sperm DNA organization and maintenance in *Bos taurus*. **BMC Genomics**. 20: 1-12.
- Celeghini, E.C.C., de Arruda, R.P., de Andrade, A.F.C., Nascimento, J., and Raphael, C.F. (2007). Practical techniques for bovine sperm simultaneous fluorimetric

- assessment of plasma, acrosomal and mitochondrial membranes. **Reproduction in Domestic Animals**. 42: 479-488.
- Cerolini, S., Zaniboni, L., Maldjian, A., and Gliozzi, T. (2006). Effect of docosahexaenoic acid and α -tocopherol enrichment in chicken sperm on semen quality, sperm lipid composition and susceptibility to peroxidation. **Theriogenology**. 66: 877–886.
- Cheignon, C., Tomas, M., Bonnefont-Rousselot, D., Faller, P., Hureau, C., and Collin, F. (2018). Oxidative stress and the amyloid beta peptide in Alzheimer's disease. **Redox Biology**. 14: 450–464.
- Chelucci, S., Pasciu, V., Succu, S., Addis, D., Leoni, G.G., Manca, M.E., Naitana, S., and Berlinguer, F. (2015). Soybean lecithin-based extender preserves spermatozoa membrane integrity and fertilizing potential during goat semen cryopreservation. **Theriogenology**. 83: 1064–1074.
- Cheng, P.N., Pham, J.D., and Nowick, J.S. (2013). The supramolecular chemistry of β -sheets. **Journal of the American Chemical Society**. 135(15): 5477–5492.
- Da Costa, B.B., Marques, L.S., Lassen, P.G., Rodrigues, R.B., Silva, H.T.R., Moreira, J.C.F., and Streit, D.P. (2020). Effects of cysteine supplementation on the quality of cryopreserved sperm of South American silver catfish. **Aquaculture Research**. 51: 455–464.
- Das, P.K., Mukherjee, J., and Banerjee, D. (2023). Functional morphology of the male reproductive system. **Textbook of Veterinary Physiology**. Springer, Singapore.
- Das, S., Nandi, P.R., Sarkar, P., Tudu, K.C., Rai, S., Behera, R., Mandal, A., Mondal, M., and Karunakaran, M. (2021). Effect of superoxide dismutase, catalase, and glutathione reductase supplementation on cryopreservation of Black Bengal buck semen. **Tropical Animal Health and Production**. 53: 1-7.
- Dewry, R.K., Deka, B.C., Bhuyan, D., Biswas, R.K., Sinha, S., Hussain, Z., Das, A., Borah, P., and Hazarika, S.B. (2015). Effect of vitamin E on the quality of frozen buck semen. **The Indian Journal of Small Ruminants**. 21: 343-346.
- El-Khawagah, A.R.M., Rawash, Z.M., El-Badry, D.A., and Kandiel, M.M. (2020). Influence of butylated hydroxytoluene addition to cryodiluents on freezability and DNA integrity of Boer and Zaraibi buck spermatozoa. **Asian Pacific Journal of Reproduction**. 9(2): 96-103.

- Estrada, E., Rodriguez-Gil, J.E., Rivera Del Alamo, M.M., Pena, A., and Yeste, M. (2017). Effects of reduced glutathione on acrosin activity in frozen-thawed boar spermatozoa. **Reproduction Fertility and Development**. 29: 283–293.
- Fathi, M., Zaher, R., Ragab, D., Gamal, I., Mohamed, A., Naga, E.A.E., and Badr, M. (2019). Soybean lecithin-based extender improves Damascus goat sperm cryopreservation and fertilizing potential following artificial insemination. **Asian Pacific Journal of Reproduction**. 8(4): 174-180.
- Frau, P.P., Soler, A.J., Iniesta-Cuerda, M., Martín-Maestro, A., Sánchez-Ajofrín, I., Medina-Chávez, D.A., Fernández-Santos, M.R., García-Álvarez, O., Maroto-Morales, A., Montoro, V., and Garde, J.J. (2020). Sperm cryodamage in ruminants: Understanding the molecular changes induced by the cryopreservation process to optimize sperm quality. **International Journal of Molecular Sciences**. 21: 1-22.
- Forouzanfar, M., Sharafi, M., Hosseini, S.M., Ostadhosseini, S., Hajian, M., Hosseini, L., Abedi, P., Nili, N., Rahmani, H.R., and Nasr-Esfahani, M.H. (2010). In vitro comparison of egg yolk-based and soybean lecithin-based extenders for cryopreservation of ram semen. **Theriogenology**. 73(4): 480–487.
- Gadea, J., Gumbao, D., Gomez-Gimenez, B., and Carlos-Gardon, J. (2013). Supplementation of the thawing medium with reduced glutathione improves function of frozen-thawed goat spermatozoa. **Reproductive Biology**. 13: 24-33.
- Gadella, B.M., and Luna, C. (2014). Cell biology and functional dynamics of the mammalian sperm surface. **Theriogenology**. 81: 74–84.
- Galian, S., Peinado, B., Almela, L., Poto, A., and Ruiz, S. (2023). Post-thaw quality of spermatozoa frozen with three different extenders in the Murciano Granadina goat breed. **Animals**. 13(2): 1-14.
- Gangwar, C., Kharche, S.D., Ranjan, R., Kumar, S., Goel, A.K., Jindal, S.K., and Agarwal, S.K. (2015). Effect of vitamin C supplementation on freezability of Barbari buck semen. **Small Ruminant Research**. 129: 104-107.
- Gao, D., and Critser, J.K. (2000). Mechanisms of cryoinjury in living cells. **ILAR Journal**. 41: 187-196.

- Goswami, M.K., Sinha, S., Deka, B.C., Bhuyan, M., and Biswas, R.K. (2021). Effect of addition of vitamin E and caffeine on quality of frozen goat semen. **The Pharma Innovation Journal**. 10: 1-4.
- Hassan, S.A., Khalil, W.A., Hassan, M.A.E., Yousif, A.I., Sabry, O.M., Wink, M., and Sobeh, M. (2021). Antioxidant and antiapoptotic effects of a *Turraea fischeri* leaf extract on cryopreserved goat sperm. **Animals**. 11: 1-13.
- Heidari, M., Qasemi-Panahi, B., Moghaddam, G., Daghigh-Kia, H., and Masoudi, R. (2022). L-carnitine improves quality parameters and epigenetic patterns of buck's frozen-thawed semen. **Animal reproduction science**. 247: 1-8.
- Hu, J.H., Zhao, X.L., Tian, W.Q., Zan, L.S., and Li, Q.W. (2011). Effects of vitamin E supplementation in the extender on frozen-thawed bovine semen preservation. **Animal**. 5: 107–112.
- Intawicha, P., Moonmanee, T., Saengwong, S., Lumsangkul, C., Liao, Y.J., and Inyawilert, W. (2022). The replacement of fresh egg yolk by lyophilized egg yolk in Tris-base extender in cryopreserved Boer and Saanen semen. **Reproduction in Domestic Animals**. 57(8): 928–935.
- Jala, R.C.R., Chen, B., Li, H., Zhang, Y., Cheong, L-Z., Yang, T., and Xu, X. (2016). Enzymatic preparation and characterization of soybean lecithin-based emulsifiers. **Grasas Aceites**. 67(4): 1-8.
- Khosravizadeh, Z., Khodamoradi, K., Rashidi, Z., Jahromi, M., Shiri, E., Salehi, E., and Talebi, A. (2022). Sperm cryopreservation and DNA methylation: possible implications for ART success and the health of offspring. **Journal of Assisted Reproduction and Genetics**. 39: 1815–1824.
- Kommisrud, E., Paulenz, H., Sehested, E., and Grevle, I.S. (2002). Influence of boar and semen parameters on motility and acrosome integrity in liquid boar semen stored for five days. **Acta Veterinaria Scandinavica**. 43: 49–55.
- Levkova, M., Radanova, M., and Angelova, L. (2022). Potential role of dynein-related genes in the etiology of male infertility: A systematic review and a meta-analysis. **Andrology**. 10(8): 1484–1499.
- Li, R., Zhao, H., Li, B., Wang, S., and Hua, S. (2023). Soybean lecithin and cholesterol-loaded cyclodextrin in combination to enhances the cryosurvival of dairy goat semen. **Cryobiology**. 112: 1-6.

- Liang, J., Larbi, A., Lv, C., Ali, S., Wu, G., and Quan, G. (2022). Fertility results after exocervical insemination using goat semen cryopreserved with extenders based on egg yolk, skim milk, or soybean lecithin. **Reproduction in Domestic Animals**. 58: 431-442.
- Lin, M., Ling, P., He, Q., Chen, D., Zheng, L., Tang, L., and Jiang, S.W. (2023). Low acrosin activity is associated with decreased Spam1/acrosin expression and GSH deficiency-caused premature acrosome release of human sperm cells. **Cell and Tissue Research**. 394: 529–545.
- Lone, S.A., Mohanty, T.K., Bhakat, M., Baithalu, R.K., and Kumar, R. (2017). Effect of dilution on cryosurvival of low sperm doses: A review. **Cryo letters**. 38: 471–476.
- Lu, J., Wang, Z., Cao, J., Chen, Y., and Dong, Y. (2018). A novel and compact review on the role of oxidative stress in female reproduction. **Reproductive Biology and Endocrinology**. 16: 1-18.
- Lushchak, V.I. (2012). Glutathione homeostasis and functions: potential targets for medical interventions. **Journal of Amino Acids**. 2012: 1-26.
- Maeder, M.L., Angstman, J.F., Richardson, M.E., Linder, S.J., Cascio, V.M., Tsai, S.Q., Ho, Q.H., Sander, J.D., Reyon, D., Bernstein, B.E., Costello, J.F., Wilkinson, M.F., and Joung, J.K. (2013). Targeted DNA demethylation and activation of endogenous genes using programmable TALE-TET1 fusion proteins. **Nature Biotechnology**. 31: 1137–1142.
- Mazur, P. (1984). Freezing of living cells: mechanisms and implications. **American Journal of Physiology**. 247: 125-142.
- Memon, A.A., Wahid, H., Rosnina, Y., Goh, Y.M., Ebrahimi, M., Nadia, F.M., and Audrey, G. (2011). Effect of butylated hydroxytoluene on cryopreservation of Boer goat semen in tris egg yolk extender. **Animal Reproduction Science**. 129: 44-49.
- Merati, Z., and Farshad, A. (2021). Supplementary role of vitamin E and amino acids added to diluent on goat sperm freezability. **Cryobiology**. 100: 151-157.
- Mosca, F., Madeddu, M., Sayed, A.A., Zaniboni, L., Iaffaldano, N., and Cerolini, S. (2016). Combined effect of permeant and non-permeant cryoprotectants on the quality of frozen/thawed chicken sperm. **Cryobiology**. 73(3): 343–347.
- Nguyen, V.V., Ponchunchoovong, S., Kupittayanant, S., and Kupittayanant, P. (2019). Effects of egg yolk and soybean lecithin on sperm quality determined by

- computer-assisted sperm analysis and confocal laser scanning microscope in chilled canine sperm. **Veterinary Medicine and Science**. 5: 345-360.
- Naing, S.W., Wahid, H., Azam, K.M., Rosnina, Y., Zuki, A.B., Kazhal, S., Bukar, M.M., Thein, M., Kyaw, T., and San, M.M. (2010). Effect of sugars on characteristics of Boer goat semen after cryopreservation. **Animal Reproduction Science**. 122: 23–28.
- Nordstoga, A.B., Soderquist, L., Adnoy, T., and Paulenz, H. (2011). Fertility results after vaginal deposition of frozen-thawed buck semen diluted with two different extenders using one- or two-step procedures. **Reproduction in Domestic Animals**. 46: 82-86.
- Oldenhof, H., Schütze, S., Wolkers, W.F., and Sieme, H. (2016). Fourier transform infrared spectroscopic analysis of sperm chromatin structure and DNA stability. **Andrology**. 4(3): 430–441.
- Ozer Kaya, S., Gur, S., and Kaya, E. (2018). Effect of l-arginine addition on long-term storability of ram semen. **Andrologia**. 50: 1-5.
- Ozturk, A.E., Bodu, M., Bucak, M.N., Agir, V., Ozcan, A., Keskin, N., Ili, P., Topraggaleh, T.R., Sidal, H., Baspimar, N., and Dursun, S. (2020). The synergistic effect of trehalose and low concentrations of cryoprotectants can improve post-thaw ram sperm parameters. **Cryobiology**. 95: 157-163.
- Pachetti, M., Zupin, L., Venturin, I., Mitri, E., Boscolo, R., D’Amico, F., Vaccari, L., Crovella, S., Ricci, G., and Pascolo, L. (2020). FTIR spectroscopy to reveal lipid and protein changes induced on sperm by capacitation: Bases for an improvement of sample selection in ART. **International Journal of Molecular Sciences**. 21(22): 1-16.
- Paoli, D., Gallo, M., Rizzo, F., Baldi, E., Francavilla, S., Lenzi, A., Lombardo, F., and Gandini, L. (2011). Mitochondrial membrane potential profile and its correlation with increasing sperm motility. **Fertility and Sterility**. 95: 2315–2319.
- Parrella, A., Medrano, L., Aizpurua, J., and Gómez-Torres, M.J. (2024). Phospholipase C zeta in human spermatozoa: A systematic review on current development and clinical application. **International Journal of Molecular Sciences**. 25(2): 1-24.

- Paul, R.K., Balaganur, K., Kumar, D., and Singh, R. (2019). Mimicking the cauda epididymal plasma-like osmolality in extender improves liquid preservation of ram semen at 3–5°C. **Systems Biology in Reproductive Medicine**. 65: 474–482.
- Penalva, D.A., Furland, N.E., López, G.H., Aveldaño, M.I., and Antollini, S.S. (2013). Unique thermal behavior of sphingomyelin species with nonhydroxy and 2-hydroxy very-long-chain (C28–C32) PUFAs. **Journal of lipid research**. 54(8): 2225–2235.
- Pongsetkul, J., Siriwong, S., Thumanu, K., Boonanuntanasarn, S., and Yongsawatdigul, J. (2023). Investigating the effect of various sous-vide cooking conditions on protein structure and texture characteristics of Tilapia fillet using synchrotron radiation-based FTIR. **Foods**. 12(3): 1-14.
- Prastiya, R.A., Munir, M.M., and Nugroho, A.P. (2021). The protective impacts of α -tocopherol supplementation on the semen quality of Sapera goat preserved at 4°C. **Tropical Animal Science Journal**. 44: 261-266.
- Purdy, P.H. (2006). A review on goat sperm cryopreservation. **Small Ruminant Research**. 63: 215-225.
- Rana, A.P., Majumder, G.C., Misra, S., and Ghosh, A. (1991). Lipid changes of goat sperm plasma membrane during epididymal maturation. **Biochimica et Biophysica Acta**. 1061(2): 185–196.
- Rawash, Z.M., Ebtihal-Ibrahim, A., and El-Raey, M. (2018). Effects of reduced glutathione on Boer goat semen freezability. **Asian Pacific Journal of Reproduction**. 7(1): 33-38.
- Rival, C.M., Xu, W., Shankman, L.S., Morioka, S., Arandjelovic, S., Lee, C.S., Wheeler, K.M., Smith, R.P., Haney, L.B., Isakson, B.E., Purcell, S., Lysiak, J.J., and Ravichandran, K.S. (2019). Phosphatidylserine on viable sperm and phagocytic machinery in oocytes regulate mammalian fertilization. **Nature communications**. 10(1): 1-13.
- Salmani, H., Towhidi, A., Zhandi, M., Bahreini, M., and Sharafi, M. (2014). In vitro assessment of soybean lecithin and egg yolk-based diluents for cryopreservation of goat semen. **Cryobiology**. 68: 276-280.

- Santella, R.M. (2006). Approaches to DNA/RNA extraction and whole genome amplification. **Cancer Epidemiology Biomarkers and Prevention**. 15: 1585–1587.
- Shafiei, M., Forouzanfar, M., Hosseini, S.M., and Esfahani, M.H. (2015). The effect of superoxide dismutase mimetic and catalase on the quality of post thawed goat semen. **Theriogenology**. 83: 1321-1327.
- Shan, S., Xu, F., Hirschfeld, M., and Brenig, B. (2021). Sperm lipid markers of male fertility in mammals. **International Journal of Molecular Sciences**. 22(16): 1-21.
- Sharma, A., Sood, P., and Chaudhary, J.K. (2020). Comparative efficacy of different concentrations of egg yolk for cryopreservation of goat semen. **Indian Journal of Animal Sciences**. 90(4): 560–563.
- Shivanoor, S.M., and David, M. (2015). Fourier transform infrared (FT-IR) study on cyanide induced biochemical and structural changes in rat sperm. **Toxicology Reports**. 2: 1347–1356.
- Simon, L., Emery, B.R., and Carrell, D.T. (2017). Review: Diagnosis and impact of sperm DNA alterations in assisted reproduction. **Best Practice & Research Clinical Obstetrics and Gynaecology**. 44: 38–56.
- Simon, A., Gounou, C., Tan, S., Tiefenauer, L., Di Berardino, M., and Brisson, A.R. (2013). Free-standing lipid films stabilized by Annexin-A5. **Biochimica et Biophysica Acta**. 1828(11): 2739–2744.
- Souza, C.V., Brandão, F.Z., Santos, J.D.R., Alfradique, V.A.P., Santos, V., Morais, M., Rangel, P.S.C., Silva, A.A.D., and Souza-Fabjan, J.M.G. (2019). Effect of different concentrations of l-carnitine in extender for semen cryopreservation in sheep. **Cryobiology**. 89: 104–108.
- Sun, L., Fan, W., Wu, C., Zhang, S., Dai, J., and Zhang, D. (2020). Effect of substituting different concentrations of soybean lecithin and egg yolk in tris-based extender on goat semen cryopreservation. **Cryobiology**. 92: 146–150.
- Swelum, A.A.A., Saadeldin, I.M., Alanazi, M.B., Awadh, H.B., Afifi, M., and Alowaimer, A.N. (2018). Effects of adding egg yolks of different avian species to tris glycerol extender on the post-thawing quality of buck semen. **Animal Reproduction Science**. 195: 345-354.

- Tuncer, P.B., Bucak, M.N., Buyukleblebici, S., Sariozkan, S., Yeni, D., Eken, A., Akalin, P.P., Kinet, H., Avdatek, F., Fidan, A.F., and Gundogan, M. (2010). The effect of cysteine and glutathione on sperm and oxidative stress parameters of post-thawed bull semen. **Cryobiology**. 61: 303–307.
- Ugur, M.R., Abdelrahman, A.S., Evans, H.C., Gilmore, A.A., Hitit, M., Arifiantini, R.I., Purwantara, B., Kaya, A., and Memili, E. (2019). Advances in cryopreservation of bull sperm. **Frontiers in Veterinary Science**. 6: 1-15.
- Whitlock, J.M., and Chernomordik, L.V. (2021). Flagging fusion: Phosphatidylserine signaling in cell-cell fusion. **The Journal of Biological Chemistry**. 296: 1-16.
- Woods, E.J., Thirumala, S., Badhe-Buchanan, S.S., Clarke, D., and Mathew, A.J. (2016). Off the shelf cellular therapeutics: Factors to consider during cryopreservation and storage of human cells for clinical use. **Cytotherapy**. 18: 697-711.
- Yeste, M. (2016). Sperm cryopreservation update: Cryodamage, markers, and factors affecting the sperm freezability in pigs. **Theriogenology**. 85(1): 47-64.
- Zhao, F., Li, R., Liu, Y., and Chen, H. (2023). Perspectives on lecithin from egg yolk: Extraction, physicochemical properties, modification, and applications. **Frontiers in Nutrition**. 9: 1-8.
- Zhao, J., Meng, P., Jin, M., Ma, X., Ma, H., Yang, H., Chen, Y., Zhang, J., Zhang, Y., Luo, Y., and Liu, J. (2023). Combined addition of l-carnitine and l-proline improves cryopreservation of dairy goat semen. **Animal Reproduction Science**. 257: 1-11.
- Zhang, W., Min, L., Li, Y., Lang, Y., Hoque, S.A.M., Adetunji, A.O., and Zhu, Z. (2022). Beneficial effect of proline supplementation on goat spermatozoa quality during cryopreservation. **Animals**. 12(19): 2626.
- Zhou, J., Zhang, K., Gao, J., Xu, J., Wu, C., He, M., Zhang, S., Zhang, D., Dai, J., and Sun, L. (2023). Effect of *Poria cocos* mushroom polysaccharides (PCPs) on the quality and DNA methylation of cryopreserved Shanghai white pig spermatozoa. **Cells**. 12 (11): 1-14.
- Zou, J., Wei, L., Li, D., Zhang, Y., Wang, G., Zhang, L., Cao, P., and Li, G. (2022). Study on cryopreservation of Guanzhong dairy goat semen with bovine semen seminal plasma. **Theriogenology**. 189: 113–117.

- Zou, J., Wei, L., Li, D., Zhang, Y., Wang, G., Zhang, L., Cao, P., Yang, S., and Li, G. (2021). Effect of glutathione on sperm quality in Guanzhong dairy goat sperm during cryopreservation. **Frontiers in Veterinary Science**. 8: 1-6.
- Zuidema, D., Kerns, K., and Sutovsky, P. (2021). An exploration of current and perspective semen analysis and sperm selection for livestock artificial insemination. **Animals**. 11: 3563.