SUPLEMENTASI AKROSIN PADA SEMEN KAMBING PERANAKAN ETAWA *(PE) PASCA THAWING* TERHADAP PENINGKATAN KUALITAS DAN POTENSI SPERMATOZOA (Penelitian Eksperimental Laboratoris)

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ACROSIN ; BIOLOGICAL POTENCY; SPERMATOZOA
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RINGKASAN

SUPLEMENTASI AKROSIN

PADA SEMEN KAMBING PERANAKAN ETAWA *(PE) PASCA THAWING*

TERHADAP PENINGKATAN KUALITAS DAN POTENSI SPERMATOZOA

Budi Utomo

Perkembangan populasi ternak kambing di Indonesia belum mencapai keadaan yang menggembirakan, bahkan di Jawa Timur pada tahun 2007 terjadi penurunan populasi ternak kambing sebesar 3,24 % (Anonimous, 2007). Pemerintah melalui program inseminasi buatan berusaha mengatasi penurunan populasi ternak kambing tersebut. Namun demikian sejauh ini usaha pemerintah tersebut belum membuahkan hasil yang optimal.

Salah satu faktor utama penyebab turunnya populasi ternak kambing tersebut adalah adanya gangguan reproduksi, terutama gangguan fertilisasi yaitu gagalnya sel sperma untuk menembus sel telur. Kegagalan penetrasi sel sperma ke dalam sel telur, disebabkan oleh berkurangnya potensi enzim yang ada pada spermatozoa tersebut , khususnya enzim akrosin yang berfungsi dalam penetrasi zona pelusida pada sel telur. Di Indonesia penelitian tentang peran dan fungsi akrosin dalam fertilisasi, khususnya penetrasi pada zona pelusida sel telur belum pernah dilaporkan.

Tujuan umum yang akan dicapai dalam penelitian ini adalah mengetahui peran akrosin terhadap potensi biologis spermatozoa serta peran akrosin terhadap penetrasi zona pelusida. Tujuan khusus yang akan dicapai dalam penelitian ini adalah pengaruh akrosin terhadap kualitas dan penetrasi spermatozoa terhadap zona pelusida.

Penelitian ini terdiri dari dua bagian yaitu : penelitian pertama suplementasi akrosin spermatozoa kambing PE dosis 0; 3,0; 4,5 dan 6,0 µg terhadap persentase motilitas, abnormalitas, viabilitas, integritas membran, kapasitasi dan reaksi akrosom. Penelitian kedua suplementasi akrosin spermatozoa kambing PE dosis 0; 3,0; 4,5 dan 6,0 µg terhadap fertilisasi in vitro. Kemudian untuk mengetahui ikatan antigen dan antibodi akrosin dilakukan uji imunositokimia.

Hasilnya yaitu : suplementasi akrosin 4,5 µg dapat meningkatkan motilitas, viabilitas, kapasitasi dan reaksi akrosom spermatozoa kambing PE. Suplementasi akrosin 6,0 µg menurunkan motilitas spermatozoa. Suplementasi akrosin 3,0 dan 4,5 µg menurunkan reaksi non kapasitasi spermatozoa kambing PE. Uji imunositokimia menunjukkan adanya ikatan antigen-antibodi pada permukaan kepala spermatozoa. Pada uji fertilisasi in vitro dengan suplementasi

akrosin 0; 3,0; 4,5 dan 6,0 µg terjadi pembelahan sel (cleavage) 40; 60; 60 dan 0% pada oosit.
Kesimpulan : suplementasi akrosin dosis 4,5 µg dapat untuk meningkatkan motilitas, viabilitas, kapasitasi maupun reaksi akrosom, sedangkan suplementasi akrosin 3,0 µg selama inkubasi 30 menit sudah cukup untuk pembelahan sel (cleavage).

SUMMARY

SUPPLEMENT OF ACROSIN TO THE POST THAWING SPERM

OF HALF-BREED OF ETAWA GOAT *(PE)*

TOWARDS INCREASING QUALITY AND POTENCY OF SPERMATOZOA

Budi Utomo

The development of goats population in Indonesia has not reached satisfactory condition, in East Java in the year 2007 the population of goat decreased for about 3,24 % (Anonimous, 2007). The government has been trying to solve the problem concerning the decreas of goat cattle population by using artificial insemination, however this effort has not been resulted in satisfactory condition.

One of the main factor of the decreasing goat population is the reproduction problem, especially fertilization failure, in which sperm sperm cell has not capable to fertilize the ovum. The failure of sperm cell penetration is caused by the reducing enzyme potency in the spermatozoa, especially acrosin enzyme that has function of the zona pelusida in the ovum. In Indonesia, research about role and acrosin function in the fertilization, especially penetration on the zona pelusida in ovum especially in goats has not been reported yet.

The general aim of the research was to determine the role of acrosin towards the biological potency of spermatozoa to penetrate the zona pelusida. The specific aim of this research was to determine effect of acrosin against the quality and the penetration of spermatozoa to the zona pelusida.

The research has two parts : The first experiment was goat spermatozoa acrosin supplemented with acrosin dosages 0; 3.0; 4.5 and 6.0 µg toward motility presentage, abnormality, viability, integrity membrane, capacity, and acrosomal reaction. The second experiment was goat spermatozoa supplemented with acrosin dosages 0; 3.0; 4.5 and 6.0 µg toward fertilization in vitro. The reaction between antigen and antibody of acrosin was tested with imunosito chemistry.

The results were : acrosin supplement 4.5, µg increased motility, viability, capacitation, and acrosomal reaction of spermatozoa. Acrosin supplement 3.0 and 4.5 µg decreased goat spermatozoa, non capacitation reaction. Imunosito chemistry tested shown the union antigen – antibody on the surface of head spermatozoa. The result of fertility test with acrosin supplemented 0; 3.0; 4.5;

and 6.0 µg the rate of cleavage of the oocyte was 40; 60; 60; and 0 % respectively.

In conclusion, dosage acrosin supplement 4.5 µg could be used to increase motility, viability even acrosin reaction, however acrosin supplement 3,0 µg for 30 minutes was enough to induce cleavage.

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ABSTRACT

The development of goats population in Indonesia has not reached a satisfactory condition, in East Java in the 2007 population of goats decreased for about 3,24%. (Anonymous, 2007).The obstacle which is faced in the goats breeding field is involving reproduction, the problem includes failure sperm cell to penetrate zona pellucida on egg cell due to the of less potency enzyme acrosin and this is the first factor which hampers goats reproduction.

This research consisted of two experiment. The first experiment was biological test for determining the potency of spermatozoa after thawing supplemented with acrosin at the dosages of 0; 3.0; 4.5 and 6.0 for 30 and 60 minutes respectively. This biological test including that for motility, viability, abnormality, capacity, non capacity and acrosome reaction. The second experiment was to test the fertility of that spermatozoa for their capability to fertilize ova in vitro.

The results were, in the first experiment supplement of acrosin 4.5 µg increased motility goat PE's spermatozoa. Supplement of acrosin 3.0 and 4.5 µg increased viability, capacity and spermatozoa goat acrosom reaction. In the second experiment the percentage of cleavage of oocytes were 40; 60; 60; and 0 for spermatozoa supplemented with 0; 3.0; 4.5 and 6.0 of acrosin respectively.

The conclusion were supplement acrosin with dosage 4.5 µg increased quality of sperm and acrosin supplement 3.0 µg for 30 minutes increased potency of sperm.

Key words: Acrosin, quality sperm, and Biological Potency.