



Characteristics of semen of Japanese Black cattle orally administered 5-aminolevulinic acid (5-ALA)

Collaborative study with Prof. Hiroshi Harayama, Kobe University
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Materials and Methods

Materials 37 Japanese Black male cattle (Control group, 14; Study group A, 12; Study group B, 11)

Methods ● **Duration:** 12-14 months old

● **Groups:** Control Group: Management without feeding 5-ALA
Study Group A: Continuous administration of 100 mg/day of 5-ALA from the initial sperm collection
Study Group B: Continuous administration of 100 mg/day of 5-ALA from one month before the initial sperm collection

● **Test items:** Sperm motility (percentage of spermatozoa showing active (+++) forward progression movement, sperm malformation rate)

Result 1: Characteristics of semen at the time of collection

Group	Number of Cattle	Total Number of Collection Required	Collect Volume (ml)	Sperm Cell Concentration (10 ⁸ cells/ml)	Motility Activity (+++) (%)	Motility Activity (+++) ≥70%	Passed Rate*
Control	14	312	3.1 ^A	10.0 ^a	56.2 ^a	43.3% ^A	64.3%
Group A	12	157	3.1 ^A	7.6 ^b	61.6 ^b	62.4% ^B	91.7%
Group B	11	128	2.8 ^B	7.6 ^b	62.0 ^b	63.3% ^B	81.8%

Significant difference among the groups was observed. AB, P < 0.05; ab, P < 0.01.

*Passed rate at the time of collection: Proportion of male cattle from which active (+++) sperm with motility of 70% or more was obtained for 5 times or more.

Result 2: Characteristics of semen after freeze and thaw

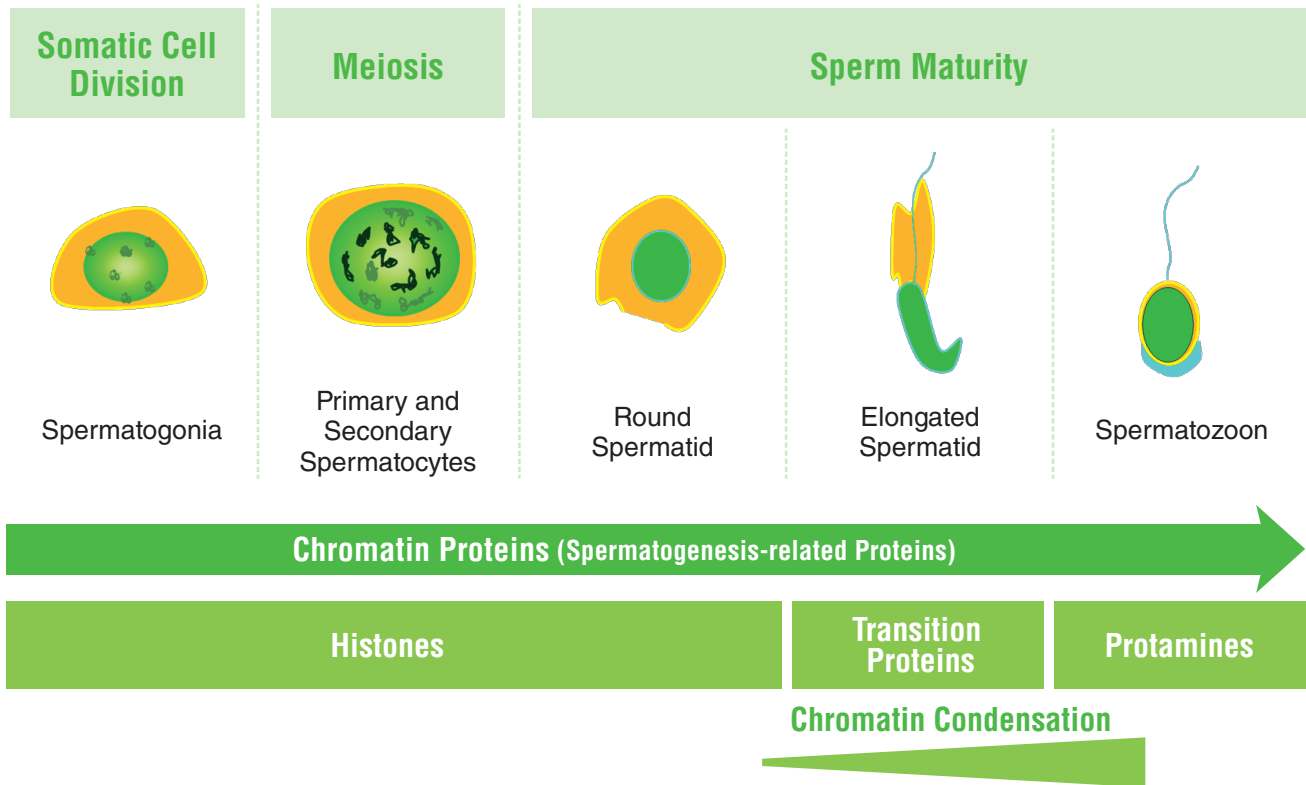
Group	Number of Test	Motility Activity (+++) (%)	Sperm Malformation Rate (%)
Control	48	37.2	10.8 ^a
Group A	58	35.3	7.0 ^b
Group B	48	35.1	4.8 ^c

Significant difference among the groups was observed. P < 0.01.

It was suggested that 5-ALA feeding to male cattle would reduce the sperm malformation rate and improve sperm activity.



Process of Spermatogenesis in Mammals



Spermatogenesis Cycle: Bovine 54 days, Pig 34 days, Mouse 35 days
 Sperm Maturation Period in the Epididymis: About 10 days (1-2 weeks)