3rd INTERNATIONAL and 12th NATIONAL ANIMAL SCIENCE CONFERENCE
ZOOTEKNİ FEDERATION 2013

EFFECTS OF KINSHIP MATINGS ON HATCHABILITY OF FERTILE JAPANESE QUAIL EGGS

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It is known that inbreeding increases the homozygosity ratio, whereby the probability of homozygosity of semi-lethal or lethal genes also increases. Furthermore, it leads also to an impoverishment of the genomes. The probability of inbreeding depression is higher for traits with low heritability, such as reproductive traits, than for traits with relatively higher heritability.
In this study, the effects of different kinship mating on fertile egg hatchability (FEH) were investigated.

MATERIAL and METHODS



Mother-son (MS)
Father-daughter (FD)
Full-sibling (FS)
Half-sibling (HS)
not related (CONT) matings

Female-male ratio
1:1 for related mating
2:1 for CONT mating

2310 quail eggs
4 incubation



Fertilized eggs and embryo losses were determined after hatching. Hatchability was recorded as a binomial trait. A threshold model with incubation parties and mating groups as fixed factors was analyzed using the generalized estimating equation method. Odds ratios ($\Psi=e^{b}$) were calculated from the estimation values (b) and Euler's number (e).

RESULTS

Estimated value (b), Odds Raito (Ψ) and *P*-value for hatchability of fertile eggs

	b	Ψ	FEH
MS	-0.7876	0.46^{a}	58%
FD	-0.4832	0.62^{b}	63%
FS	-0.3159	0.73^{b}	69%
HS	0.1372	1.15^{c}	76%
CONT	0	1^{c}	73%
P	<.0001		-

The effect of mating type was significant (P<0.0001). The probability of hatching of eggs from mating that has F=0.25 inbreeding coefficients (MS, FD, FS) were 27% to 54% lower than from mating produce no inbreed (CONT) (P<0.05). Interestingly, the probability of HS eggs to hatch were light higher than the CONT eggs, but not significant (P>0.05). Eggs hatching probability from MS mating were significantly lower than FD and FS (P<0.05). On the other hand, no significant difference was observed for the hatching probabilities between FD and FS eggs (P> 0.05).





CONCLUSION

The results reflect the difference in the genetic relationship between parents and offspring versus between siblings. While the relationship between parents and offspring are absolute, the relationship between siblings are relative averages.