遗传学报　1989 16 (4): 291-298　ISSN: 0379-4172　CN: 11-5450/R

动物模型及多性状BLUP在家禽遗传鉴定中的应用

庞 航, 吴常信, 张 沅, 宫桂芬, 毕义辉

1.北京农业大学畜牧系；2.北京市原种鸡场

收稿日期　修回日期　网络版发布日期　接受日期

摘要　利用最佳线性无偏预测法（BLUP）估计家禽的育种植，目前除家禽外其它各家畜中得到了广 泛的应用。本文利用动物模型和多性状BLUP对“京白I系”蛋鸡在1986-1987年24个家系的77 7个个体的系统分组资料进行了分析，估计出了所有个体的复合育种植。其中考虑了两个性 状（40周产蛋数和36周蛋重）和两个固定效应（鸡舍-鸡笼效应和孵化批次效应）。同时还 对混合模型方程组维数较大时如何在微机上实现进行了研究，即（1）利用磁盘存取系数矩 阵的非零元素和中间计算结果；（2）简化了多性状BLUP的计算，利用乔列斯基（Cholesky ）分解变换后，此法建立的方程数是常规算法方程数的1/q（q为性状数）；（3）简化了方 程组迭代求解的方法，即利用块迭代法，这样大大缩短了计算的机时，节省了费用，使BLUP 在家禽中的推广应用成为可能。

关键词　家禽,动物模型,多性状BLUP,育种植

分类号

Animal Model and Multiple Trait BLUP Applied in Poultry Genetic Evaluation

Pang Hang,Wu Changxin,Zhang Yuan,Gong Guifen,Bi Yihui

1.Deparment of Animal Science,Beijing Agricultural University;2.Beijing Breeding Chicken Farm

Abstract

Best linear unbiased prediction (BLUP) is a powerful method to estimate genetic values of animals,and is widely applied in many animal species but poultry.Beiji ng White Leghorn nested data in 1986-1987 with 777 individuals were analysed by animal model and multiple traitBLUP.Two traits (40-week egg production and 36-we ek egg weight) and two fixed effects (house-pen effect and hatching batch effect) were considered.The way to calculate a large set of mixed model equations in m icro-computer was studied.Only non-zero elements of the coefficient matrix of MM E were stored on a disk.The iteration process was reduced by block iteration.It also simplified the multiple trait BLUP method,the dimension of equations is onl y1/q(q is the number of traits)of regular method.So it saved a lot of compute ti me and cost,and BLUP became applicable in poultry.The significance of using BLUP in poultry are:(1)Eliminating some fixed effects;(2)Reducing the estimation err or for unbalanced data;(3)Estimating breeding values of progeny,so we can shorte n the generation interval;(4)It can estimate breeding values of individuals with out records from the relatives'informations;(5)The breeding value of sires and d ams can be estimated from their progeny records,used for family selection;(6)Due to genetic and environmental correlation between traits and all relatives infor mation were considered,it can increase,it can increase the selection accuracy.

Key words Poultry Anmial model Multiple trait BLUP Breeding values

DOI:

通讯作者