INTRODUCTION

INTRODUCTION

The genetic alteration of living organisms to improve food production is an area in which major contributions are needed. Improvement in livestock could include increased feed efficiency, fertility, milk, and egg production, disease resistance, increased growth rate and high meat quality. The application of recombinant DNA to achieve improvement of these types awaits characterization of the genetics of the traits. Therefore, near-term progress toward these goals will be slow **(Haas, 1984).**

Birds are virtually unique among domesticated species in being bred for the nutrient value of their ova and few organisms have been subjected to as much genetic selection as poultry. These two features combine attractions as well as frustrations of producing transgenic birds **(Simkiss, 1994).**

The genetic selection of poultry with improved growth and health characteristics is a relatively slow process .In the poultry field, birds with impressive growth phenotypes have been selected. However, feed efficiency and viral and parasitic diseases are still important husbandry issues. Therefore, to address these issues, investigators are presently introducing genes into poultry using molecular genetics and gene transfer approaches. This technology of manipulating genes to increase growth rate, improve feed efficiency and important disease resistant traits would benefit both the poultry and agriculture industries **(Cioffi *et al.* 1994).**

Poultry has influences on human civilization in many ways. Eggs and meat of birds are being consumed since prehistoric times. Compared to eggs, there is no other single food of animal origin which is eaten and relished by so many people in the world **(Singh, 1985).** The poultry industry serves a very important part in converting grains and other products into eggs and poultry meat for the nutritional benefit of humanity. Providing consumers with food products of superior quality as economically as possible and at reasonable cost is the chief responsibility of agriculture **(Jull, 1987).**

Growth hormone binds directly to specific receptors in target tissue. In addition, it stimulates production of somatomedins (sulfating factors), protein synthesis, lipid carbohydrate and ion or mineral metabolism. **(Martin *et at.* 1983).**

Increase in body weight in mice occurred by transforming multiple copies of the growth hormone gene. The injection of mice embryos with the DNA fragments containing the rat growth hormone gene which fused to regulatory region of the mouse metollothionein I gene **(Palmiter *et al.* 1982).**

Lee and Shuman (1990) found that transgenic Japanese quail embryo can be produced by retrovirus infection.

The microinjection of isolated human growth hormone gene into rabbits, sheep and pig eggs showed that the integration of this gene into the chromosome of each species **(Hammer *et al.* 1986).** Meanwhile, the use of genetic engineering techniques to transfer growth hormone gene to improve meat production had been supported by **Russo (1988).**

Chen *et al.* (1990a) showed that birds received growth hormone gene of bovine were larger and matured more rapidly.

Bosselman *et at.* (1989 a and b) studied the embryos which expressed the transuded chicken growth hormone gene and proved that they contain high levels of serum growth hormone in blood, brain, muscle, testis and semen from individuals injected as embryos contained vector DNA. The growth hormone gene isolated from humans, bovine, ovine, chicken, duck, turkey and fish was transfered to produce growth hormone from *E coil* and yeast by **Yamakawa *et al.* (1989), McClary *et al.* (1990), Tsai and Tseng (1992) and Kuo andTsai (1993).**

Using a growth hormone gene system, 7 eukaryotic transcripional regulatory sequences were assayed for their ability to direct bovine growth hormone bGH gene expression in cultured fowl embryo fibroblasts and transformed quail cells **(Kopchick 1990).**

All present evidence indicates that the growth hormone content of our meat is not a threat to our wellbeing and that the consumption of meat form growth hormone transgenics is entirely safe **(Maclean 1994).**

The aim of this study is the transfer of ducks growth hormone gene and whole DNA into fertilized eggs of Japanese quail as a trial for producing strains with large body size and good quality.