

## **POULTRY SCIENCE RESEARCH AND EXTENSION-A REVIEW**

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Poultry Science Research and Extension got a tremendous support during 1980s and continue to grow faster than other sectors. The research in associated institutes was supported by both the Governments while the private poultry R&D had a steady progress. The interest, enthusiasm, situation of all the stakeholders in this mega business has led to tremendous improvement in the productivity of poultry which was not even imaginable in 1970s. The improvement was in more body weight in short period of growth with an excellent feed efficiency and livability. Hen day egg production of 335+ is common under optimal layer cage management. A relative increase in broiler price and egg price over the years has supported the sustained growth. Apart from hybrid poultry, now there is a shift from commercial chicken meat and eggs to desi chicken meat and eggs. This growing consumer trend is supported by selling desi chicken meat in large numbers by the retailers. Some myths, false propaganda might possibly driven to this situation. However, now there are improved varieties of desi chicken. All the associated institutes in the country continue their journey in poultry science research to harvest more and more for a sustainable, economical productivity.

While it is believed that all the relevant institutions are actively engaged in poultry research and extension, some of the works being carried out in Tamilnadu Veterinary and Animal Sciences University (TANUVAS) and the Directorate of Poultry Research (DPR), Hyderabad are reviewed hereunder.

### **Chicken**

Poultry Research and Extension works of TANUVAS to cater the needs of interested poultry farmers and to educate the people on poultry farming on commercial venture throughout Taminadu was started during 1980s through establishment of Poultry Research and Development Centres (PRDC). Later this capacity building works was diversified through Livestock Research and Development Centres (LRDC), Farmers Training Centres (FTC) and Krishi Vigyan Kendras (KVK) apart from Poultry Research Station (PRS) and Veterinary Colleges in TANUVAS.

Nandanam Gold, Nandanam B2, Nandanam Chicken 4, Nandanam B3 and TANUVAS Aseel Chicken were evolved by the team of scientists of PRS over the years. Nandanam B2 developed first and improving its productive traits Nandanam B3 was evolved. Both are meat variety and

widely preferred for both backyard and commercial system by the farmers. The rate of growth is so ideal for marketing in about 3 months with a body weight of about 1400 g. Foraging in back yard and supplementing home grown grains would support to sustain their satisfactory productivity. They possess the unique meat taste. Nandanam Chicken 4 is a egg type developed for backyard and also for commercial purpose yielding about 140 eggs per annum with foraging and a little feed support. Nandanam Gold was developed as a dual purpose chicken satisfying the need of rural community. Slow growth and satisfactory egg number are the advantages of this variety. Recently TANUVAS Aseel Chicken was released for the benefit of farmers and rural women. This strain is an improved one from the Aseel breed developed with the objective of improving the egg production. Under optimal management, this TANUVAS Aseel Chicken can lay about 160 eggs, almost double than the Aseel chicken. The feed efficiency, livability and good flightiness are the advantages. Pulse magnetic field exposure of hatching eggs has improved hatchability and livability of young birds ( Pers.communication, 2017). The results were more significant in Japanese quails possibly due to thin shell when compared to other avian shell eggs. Research on domestic fly control through specially designed fly capture devise is being attempted.

TANUVAS scientists has innovated Artificial Vagina to collect semen from flight less birds Ostrich and Emu and was successful in collection, storage and preservation. They have also attempted a few assisted reproductive technologies to improve fertility in poultry. Currently the

researchers here are contemplating to evolve a heat tolerant strain in colour plumage broiler chicken by pooling the Naked Neck and Frizzle germplasm.

*In ovo* administration of 0.5 ml Normal saline; 0.5 ml each of 10 per cent glucose and 0.5 per cent Lysine; 0.5 per cent Threonine and 0.5 per cent hydroxyl beta methylbutarate in to amniotic fluid os 18 day old chicken embryos has resulted in significant ( $P < 0.05$ ) improvement in hatch weight (47.85 to 48.79g) than control(47.25g). Total hatchability was increased by *in ovo* treatment by 4.60 per cent. *In ovo* feeding produced significantly ( $P < 0.05$ ) higher body weights ( 2168.69 to 2412.28 g) at sixth week of age in broilers than control (2151.50 g). Early chick nutritional supplements (ECNS) which are egg white protein glucose based; corn soyabean fish meal based; with steaming; without steaming and broiler pre starter diet have been tried alone or in chicks administered *in ovo* feeding to 18<sup>th</sup> day embryo produced appreciable results in post hatch performance ( Kanagaraju, 2013).

Inclusion of 1 per cent soya lecithin in broilers diet produced higher body weight than control up to 5<sup>th</sup> week of age and at 5 per cent level up to 6<sup>th</sup> week of age has resulted in heavier broiler body weight than control. Soya lecithin in the diets of broiler chicken has reduced feed consumption and also reduced breast muscle lipids marginally ( Ramesh, 2007).

The Poultry Science department, Veterinary College and Research Institute, Namakkal, TANUVAS has also developed a new strain to suit the rural and commercial

poultry farmers. The department has developed a multicolor plumage chicken "TANUVAS Namakkal Chicken-1" suitable for rural backyard with low input system of rearing. This bird will lay about 150 eggs, brown shell colour and almost nil broodiness.

Gramapriya, another improved native chicken variety, developed by the Directorate of Poultry Research (DPR), ICAR, Hyderabad with the objectives of providing more eggs to rural people particularly tribals. Gramapriya looks like native chicken, adapts well in backyard, with a low input management yields about 180 eggs. Male Gramapriya chicken has been rated as the best for dishes like Tandoori. Good immunity conferred to this bird against Newcastle disease, which is an added advantage for its suitability in rural backyard. Gramapriya are brooded up to 6 weeks of age and then distributed to the rural farmers for backyard rearing. In many villages even brooding is done by a few rural women and share among themselves after 6 week of age.

DPR's Krishibro, a unique colored broiler chicken which is hardy and grows satisfactorily under sub optimal management in rural and tribal areas. Vanaraja birds are light to dark brown plumage with black tail feathers. In about 6 week of age Krishibro consumes about 3 kg of feed and attains a body weight of 2 kg with an excellent survival rate. DPR also has evolved two more varieties for rural and tribal people's livelihood security viz. Vanaraja and Srinidhi. Vanaraja birds capable of attaining a good market weight need to be reared under brooders for 6 weeks and then to be

reared in back yard for dual purpose. If the back yard ambience is rich in natural feed resources 10 to 20 Vanaraja birds can be grown as layers for egg purpose under free range system. If the demand in the farmers locality is for meat, then Vanaraja birds can be reared in intensive or semi intensive system, providing balanced diet till the desired market weight.

Srinidhi is another improved dual purpose bird developed by DPR to suit tribal and rural area. However, up to 4 to 6 week of age Srinidhi birds are to be reared as brooders. At 6 week of age the live body weight would be 600 to 650 g. After wards, about a dozen birds can be reared in backyard. Foraging during time and providing shelter at night would be good for survivability and performance. Depending upon the demand, Srinidhi birds may be reared for either meat or eggs.

TANUVAS is one of the implementing centre of PSP of DPR, ICAR from its College of Poultry Production and Management, Hosur. More number of Vanaraja and Gramapriya chicks were distributed to the farmers, rural women through TANUVAS peripheral centres during last year than the stipulated target of one lakh. Field performance data were also collected and it was found to be highly satisfactory. Considering the huge demand from farmers in and around Tirunelveli, the Veterinary College and Research Institute started procuring hatching eggs of Vanaraja and Gramapriya, incubating them in their facilities and distributing to the farmers. The performance of these birds in this area also are highly encouraging.

## Japanese quail

Poultry Research Station obtained Japanese quail germplasm from Central Avian Research Institute (CARI) during early 80s and improved its performance. Over the years it has developed Nandanam quail 1, Nandanam quail 2 and Nandanam quail 3. Performance was enhanced in body weight, reduced growing period, improved feed efficiency and high survivability. Egg number and egg weight were substantially increased. Nandanam Breeder Quail was released recently for the benefit of Japanese quail breeders. It is calculated from the commercial Japanese quail farming activities in Tamilnadu that over 4 lakh chicks are hatched every week. Many J.quail farmers have established small hatchery unit in their farm to meet their own demand of chicks. Several varieties were evolved at VCRI, Namakkal also. Namakkal Quail 1, TANUVAS Namakkal Gold quail and TANUVAS meat quail were the varieties developed. Namakkal Quail 1 and TANUVAS meat quail are meat strains. TANUVAS meat quail average day old chick weight is 8 g, 3 week body weight is 165 g in males and 180 g in females and 2.1 is the feed efficiency at 21 days of age. The other meat variety Namakkal quail 1, male attains an average live body weight of 228 g at 30 days of age while the females 247 g at the same age. TANUVAS Namakkal Gold quail is the egg type variety developed attaining sexual maturity at 40 d of age, yields 257 eggs in a year with a mean egg weight of 13.2 g. CARI also has developed many Japanese quail varieties suitable for meat and egg purpose.

Dietary Nano Selenium at the dose of 10 ppm up to 5<sup>th</sup> week of age in Japanese quail has improved body weight to the extent of 10 per cent (Pratheeba, 2014) She has also recorded improved feed conversion ratio by dietary supplementation of Nano Selenium. Dietary supplementation of Se, vitamin E, *Ocimum sanctum* either alone or in combination has significantly increased antibody titre against New castle disease in J.quails upto 12 week of age (Sujatha, 2012). J.quail egg production, fertility, total hatchability, fertile hatchability, hatch weight were improved in antioxidants treatments than control. J.qua supplemented with Se, vitamin E, *Ocimum sanctum* either alone or in combination has reduced total cholesterol, triglyceride in eggs and improved egg weight. The treatment J.quails has shown improved productive and reproductive performance.

Gandhimathi (2011) studied the influence of nest box on the reproductive performance of Japanese quail upto 20 week of age in deep litter system of management. Control quails were reared in pens with out nest boxes. Treatment J.quails were provided with green, blue, white painted and natural mud pots as nest boxes. Also the number of nest boxes as one for every 5 or 10 number of female J.quail layers. The overall mean egg production of Japanese quails was significantly higher (61.38 per cent) in more nest box treatment, followed by 57.05 per cent in less number of nest boxes and control (54.71 per cent) without nest boxes. More number of eggs were laid in nest boxes than floor. J.quail's significantly preferred to lay more eggs in white colour nest box than others. Eggs laid on floor were heavier than eggs laid in

nest boxes. Fertility and hatchability were higher in treatment with nest box group than control. Providing nest box was economical and yielded higher returns. Many J.quail farmers are adopting this.

Supplementation of direct fed microbials on productive and reproductive performance in Japanese quails was studied by Mithu .A. Prince( 2012) to explore the possibilities of replacing antibiotics as a growth promoter.She used a commercial product ‘cloSTAT’ which is claimed to contain *Bacillus subtilis* because of its spore forming nature, that enables the bacteria to survive extremes of environmental conditions. This is a probiotic incorporated in the diet of Japanese quail. The 5<sup>th</sup> week body weight of J.quails supplemented with *Bacillus subtilis* has not shown any significant difference. However, inclusion at 1 g/kg diet has reduced serum cholesterol and triglyceride concentration significantly. Her research concluded that the supplementation of *Bacillus subtilis* in J.quail grower mash ( 3 to 5 week of age) at a dose of 1 g/kg of diet was advantageous in improving body weight compared to antibiotic supplements. No difference in feed consumption or feed efficiency. In J.quail layers, feeding *Bacillus subtilis* from 10 to 13 week of age at the same dose with prebiotic improved egg production, but no effect on feed efficiency and egg quality.

## **Turkey**

Research research and extension is showing improvement. Though the turkey meat was considered as a delicacy of festive season, there seems to be a shift as it is available during off season period.

Research in turkey has led to development of Nandanam turkey 1 and Nandanam turkey 2 by the researchers of Poultry Research Station, TANUVAS. Nandanam turkey 1 was the cross between native turkey and Beltsville Small white with improved productive and reproductive performance. This was crossed again with Beltsville Small white, Nandanam turkey 2 was developed with more improved performance.

Research trial conducted in Nandanam turkey 2 at Regional Research Centre, Pudukottai, TANUVAS with supplementation of Azolla at the dose of 10, 20 and 30 g per turkey per day from 6<sup>th</sup> week to 16<sup>th</sup> week of age. No difference in body weight were recorded. However, the feed consumption was low, lower and the lowest in 10, 20 and 30 g Azolla supplemented turkeys than control. It was concluded that Azolla supplementation in turkeys has reduced feed cost.(Clement Ebenezer Henri, 2015).

## **Guinea fowl**

PRS, TANUVAS has developed an improved Guinea fowl variety named Nandanam Guinea fowl 1. It is pearl variety with improved body weight and egg production in backyard with low or zero input system.

Directorate of Poultry Research, ICAR, Hyderabad is implementing All India Co-ordinated Research Project (AICRP) on Poultry Breeding and Poultry Seed Project (PSP) throughout India. The AICRP is functioning with the objectives of developing location specific chicken varieties and their dissemination for village

poultry; conservation, improvement, characterization and application of local native and elite layer and broiler germplasm and packages of practices for village poultry and entrepreneurship in rural, tribal and backyard areas. The AICRP centres are functioning in Anand Agri. University, Anand; Kerala Veterinary and Animal Science University, Mannuthy; Karnataka Veterinary, animal and Fishery Sciences University, Bengaluru; Central Avian Research Institute, Izatnagar; CSK Himachal Pradesh Krishi Viswavidyalaya, Palampur; Birsa Agricultural University, Ranchi; Maharana Pratap University of Agriculture & Technology, Udaipur; Guru Angad Dev Veterinary and Animal Science University, Ludhiana; Odisha University of agriculture and Technology, Bhubaneswar; ICAR Research Complex for NEH region, Agartala; Nanaji Deshmukh Veterinary Science University, Jabalpur and Assam Agricultural University, Guwahati. Poultry Seed Project with the objectives of producing 30000 to 100000 improved poultry seed in each implementing centre every year and distributing in their respective areas and capacity building in SAUs, SVUs and ICAR Institutes to produce poultry seed in each centre on its own. The PSP is implemented in 12 locations viz. College of Poultry Production and Management, Hosur, TANUVAS; Bihar Agricultural University, Patna; Chhattisgarh Kamadhenu Viswa Vidyalaya, Durg; ICAR Regional Research Complex for NEH region, Jharnapani and Imphal; ICAR-National Organic Farming Research Institute, Gangtok; ICAR-Central Coastal Agricultural Research Institute, Panji, Goa; ICAR-Central Island Agricultural Research

Institute, Port Blair; IVRI Regional Station, Mukteswar; ICAR Research Complex for NEH region, Umiam, Parapani and Sher-e-Kashmir University of Agricultural Sciences and Technology, Srinagar. Holistic and continued poultry research would enable the sustained growth and development.

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