TETRA
SELECTED FOR QUALITY

TETRA HB COLOR
BROILER
MANAGEMENT GUIDE

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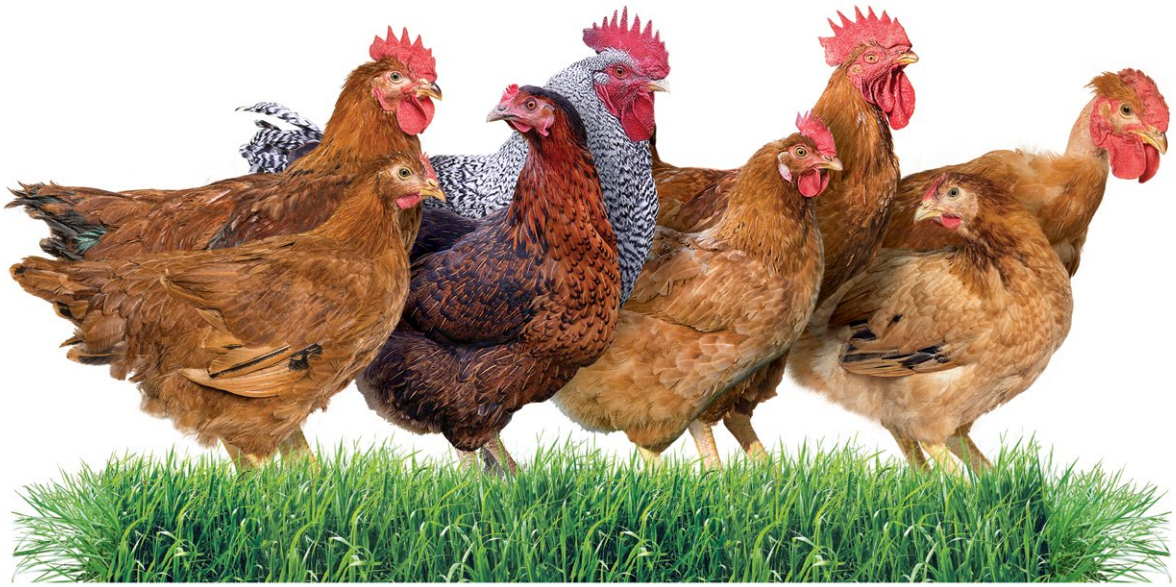


INTRODUCTION

TETRA HB COLOR is a medium-growing, coloured broiler for conventional and alternative systems. It has premium meat and tolerates lower feed quality. Its breeding lines are selected for the progenies' yield, body composition and viability.

This extended manual is a guideline and information source for maximizing profits and satisfaction with stocks; however, special requests may require assistance from the nearest Bábolna TETRA specialist due to specific climatic or lighting conditions.

Bábolna TETRA Ltd.

TETRA HB COLOR BROILER PERFORMANCE SPECIFICATIONS

Table 1

Liveability	
0-70 days	93-95%
Body weight (70 days)	
Female	2.4-2.5 kg
Male	3.1-3.2 kg
As-hatched	2.7-2.8 kg
Feed consumption (0-70 days)	
Female	6.4-6.8 kg
Male	7.6-8.0 kg
As-hatched	6.9-7.3 kg
Feed conversion ratio (FCR)	
Female	2.81 kg/kg
Male	2.61 kg/kg
As-hatched	2.71 kg/kg

GENERAL RECOMMENDATIONS AND BIOSECURITY OF POULTRY FARMS

General Rules

- Isolation of the house is vitally important for disease control.
- The movements of people are the significant threat to isolation as they may bring infection onto the farm. Ideally, shower facilities and farm clothing are provided for all employees and visitors.

Keep out cars and other vehicles from the farm area, and allow minimal traffic only. Always use sanitizing liquid for proper disinfection.

- If the above protective facilities are not fully available, access to the farm should be limited to occasions when necessary. People entering the farm must wear clean coveralls, new plastic or cleansed rubber boots and a head cap.
- Disinfectant footbaths should be placed at the entrance to each house and replenished with fresh disinfectant daily.
- Doors must be kept locked at all times to prevent unwanted visitors.
- NO TRESPASSING signs should be prominently displayed on doors and BIOSECURITY ZONE signs fixed at the farm entrance to warn visitors of possible disease transmission.

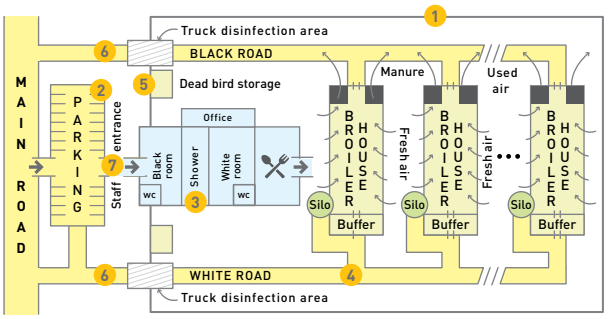
The Importance of Biosecurity

Pathogens can infect a flock via feed, wild birds, rodents, insects, day-old chicks, visitors, trucks, equipment, and other flocks. These pathogens such as bacteria, viruses and fungi can cause poor performance and outbreaks of diseases. Therefore TETRA takes disease prevention very seriously. It is far easier to prevent these problems than cure or terminate a flock.

Plan and Build

Before building a farm, one must consider some essential facts. It is best to start with good planning and attention to detail; otherwise, altering the farm after construction will be more challenging.

Figure 1: Farm Layout



1. *Fence around the farm*
2. *Parking facilities*
3. *Black and white changing rooms*
4. *Way to silos*
5. *Dead bird storage*
6. *Entrance for vehicles*
7. *Entrance for people*

Location

Build the farm as far as possible from any other farms to reduce the risk of contamination. Avoid places close to busy motorways, where poultry transfer is widespread. Prevent ingress of airborne hazards.

Single-age Flock

Avoid horizontal contamination by housing single-age flocks only. One farm should have chickens of the same age and the same breeding level. Hatcheries located close to feed mixing plants and slaughterhouses increase the transmission of infection.

Visitors

Follow the black (dirty) and white (clean) principles. Erect a fence around your farm with a closed entrance, and put an UNAUTHORIZED ENTRY PROHIBITED sign on it. Everything outside the farm is "black", and "white" inside. Minimize the number of visitors; let them in only when required. Set up parking facilities outside the fence. Visitors are not allowed to enter by car.

Around the Poultry Houses

The surroundings of the houses are to be kept clean. A tidy area helps exclude wild birds from the premises. Clean and place a 0.5-1 m strip of stone close to the wall of the poultry houses to keep rodents out. Construct the wall with smooth materials, which are stainless so that it can be easily washed with detergent or disinfectant.

Personal Hygiene

When entering, use boot and hand disinfectants. Have a "black and white" clothing room inside the biosecurity building located at the fence line. Visitors must change their clothes and remove their personal belongings. Before entering the poultry house, one has to change boots and use them only inside the house. Wear different boots on the farm and inside each house. Keep the environment clean: sweep and clean the biosecurity rooms, the poultry house entrance, and the surrounding roads.

Traffic inside the Farm Premises

Ideally, no vehicles should enter the farm.

- Feed: Put silos near the fence so the truck can fill them from outside.
- Dead birds: Collect them a minimum once a day and place them in a collecting box along fence line. The box must be closed and preferably cooled. The frequency of removal also depends on the temperature conditions.

If vehicles delivering day-old chicks, litter, manure, or the slaughterhouse lorry enter the farm, disinfect them thoroughly, especially the wheels, with a high-pressure washer. Please consult the veterinarian about choosing a suitable disinfectant. If it is necessary for the driver to get out of the truck, he/she must wear disposable clothes and boots. Entry to the poultry house is prohibited for the driver.

Records of Visitors

Keep records of visitors with the following data: name, the purpose of visit, date, and the name of the poultry facility, hatchery, slaughterhouse, and feed mill visited in the last two weeks. If one must see more than one flock, go by the following rules: visit the younger flocks first, and then the older ones; the higher then the lower breeding level. Record everything in the visitors' book.

Cleansing and Disinfection

The most effective way to reduce the negative impact of disease-causing pathogens on the flock is to avoid exposure to these organisms. A good sanitation program and effective isolation plans are vital to achieving this. Cleansing and disinfection are of prime importance to prevent reinfection of the new flock coming to the farm. After depopulation, remove all the hiding birds and bodies. An insecticide program is most effective when applied immediately in a still-warm house environment.

Dismantle the removable parts of the equipment, and clean up manure and litter. Transfer the litter far from the farm to a fermentation plant, but do not spill it onto the road during transportation. Remove residue feed from the silos, bins, and feeders. Dry clean as soon as possible after the old flock.

Soak the inside of the house, and the equipment for hours, use detergents and sufficient liquid. High-pressure cleaners effectively clean, using active detergents in cold or hot water. Ensure the staff also clean feeders, drinkers, fans, air inlets and outlets. Rinse everything with water and let the equipment and the house dry.

Always use a broad-spectrum sanitizing agent for proper disinfection of the poultry houses between flocks.

Use a multi-level disinfection programme to reduce the number of germs in the house. Maintain walls, floors, fan blades, lights, slats, feeders, and drinkers, outside and inside. Care for closed areas, like sanitation and storerooms. Effective disinfection requires clean surfaces without any remaining dirty or organic material. Calculate the dosage and the application time of the disinfectant correctly. Use disinfectants with antiviral, antibacterial and antifungal effects. Sporocides can kill very resistant parasite spores as well. Change active ingredients frequently and monitor the effect by microbiological tests. Mind that some disinfectants do not work well under low temperatures. They can harm human health, so follow instructions thoroughly and provide personal protection.

The cleansing and disinfection should be done in chicken houses and around the farm, such as in biosecurity buildings, feed stores, and litter stores. Make sure to cleanse vehicles, tools, clothes, and boots.

Water Hygiene

Water and watering systems require regular checks and maintenance. The water quality has to be checked every 6 months for microbiological and chemical compounds. Chlorinate water when necessary. When the house is empty, use effective detergents and disinfectants to remove biofilm and carbonate deposits from the pipeline.

When there are birds in the house, water lines must be flushed frequently when the weather is hot, plus before and after vaccination or medication.

Feed Hygiene

Feed quality is of prime importance. Buy feed from certified and controlled suppliers. When mixing feed on the farm use high-quality ingredients and premixes. Nutritional content, energy, protein balance, macro- and microelements, and enzymes are necessary for good development and performance. Avoid microbial contamination (bacteria, fungi) and toxins (mainly mycotoxins). Heat treatment reduces bacterial germs. Use toxin binding substances when needed. For Salmonella control, apply appropriate supplements. Heat treatment produces better homogeneity after handling. Hygienic storage and transportation of feed are also necessary. Keep silo and feed bin surroundings clean, and remove spilt feed immediately not to attract wild birds. Silos must be emptied and cleaned regularly.

Wild Bird and Rodent Control

Wild bird and rodent control is the first line of defence against the transmission of dangerous diseases. Use bird nets to prevent viral, bacteriological and parasitic infections. Doors and walls must be intact to prevent the entry of wild animals. Avoid spilling feed, and remove dead birds. Implement a rodent control program.

HEALTH MANAGEMENT

Vaccination Programmes

Before designing a vaccination program, ask the local veterinarian for help, as the epidemiological situation and the country's regulations may differ. Consider the proposals in Table 2.

Table 2: Vaccination Program Proposals for TETRA HB COLOR Broilers

Age (days)	Vaccination
0 (hatchery)	Newcastle disease (ND) spray
	Infectious bronchitis (IB) spray
12-14	Infectious bursal disease (IBD) water
21	Newcastle disease (ND) water
	Infectious bronchitis (IB) water

GROWTH

With TETRA HB COLOR, we suggest using one-phase rearing. See the following recommendations (Table 3-4-5) as a guide for stocking density, feeding and drinking space.

Table 3: Stocking Density for TETRA HB COLOR Broilers

Age (days)	Female	Male	As-hatched
	birds/m²		
0-49	15	9	12
50-70	max. 10	max. 6	max. 8

Table 4: Feeding Space for TETRA HB COLOR Broilers

Age (days)	Female	Male	As-hatched
	birds/round feeder		
0-49	60	60	60
50-70	40	40	40

Table 5: Drinking Space for TETRA HB COLOR Broilers

Age (days)	Female	Male	As-hatched
	birds/nipple drinker		
0-49	12	12	12
50-70	9	9	9

Adjust room heating and brooder temperature to the age of the birds. (Table 6)

Table 6: Temperature Requirements for TETRA HB COLOR Broilers

Age (days)	House	Brooder	
		Under the brooder	House
	°C	°C	°C
0	32	32	25
3	31	31	24
6	30	30	23
9	28	28	23
12	27	27	23
15	26	26	22
20	25	25	22
25	24	24	22
30	23	23	21
35+	21	-	21

The chicks' behaviour is the best temperature indicator, especially at night. If the birds are calm and quiet and spread equally in the house, they feel comfortable. Always measure the temperature at the bird's level. Besides the temperature, it is essential to maintain proper humidity. Keep the relative humidity between 40-60%.

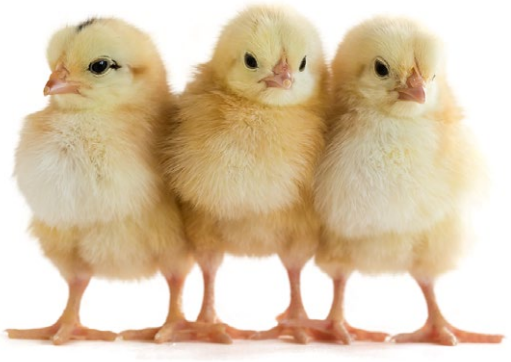
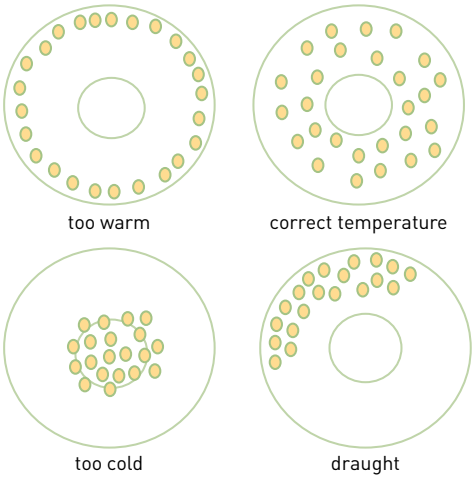


Figure 2: Indication of Chick's Well-being under the Brooder



Lighting Programmes

When the chicks arrive, watch out for proper illumination of feeders and drinkers. Later, reduce both light intensity and hours of light. (Table 7)

Table 7: Lighting Programme for TETRA HB COLOR Broilers

Age (days)	Hours of Light	Light Intensity (lux)
0	24	20
1-56	gradually decrease	gradually decrease
57-70	16	8

IMPORTANT:
Ensure flock uniformity. Achieve targets stated in the manual. Keep records of mortality, feed intake, FCR, water consumption and weekly body weight development.

TETRA HB COLOR Broiler day-old chicks are feather sexable, so genders can be placed separately or as-hatched.

We recommend keeping males and females separately to implement different feeding programs. Sexual dimorphism causes different target weights; therefore, uniformity within flocks separated by sex is easier to maintain.

Uniformity and target weight development are foremost important, besides biosecurity. Track growth with representative weight measurement, performed every week (minimum 1%). The flock's growth is normal, and the birds are homogenous if the coefficient of variation (CV) is below 10%.

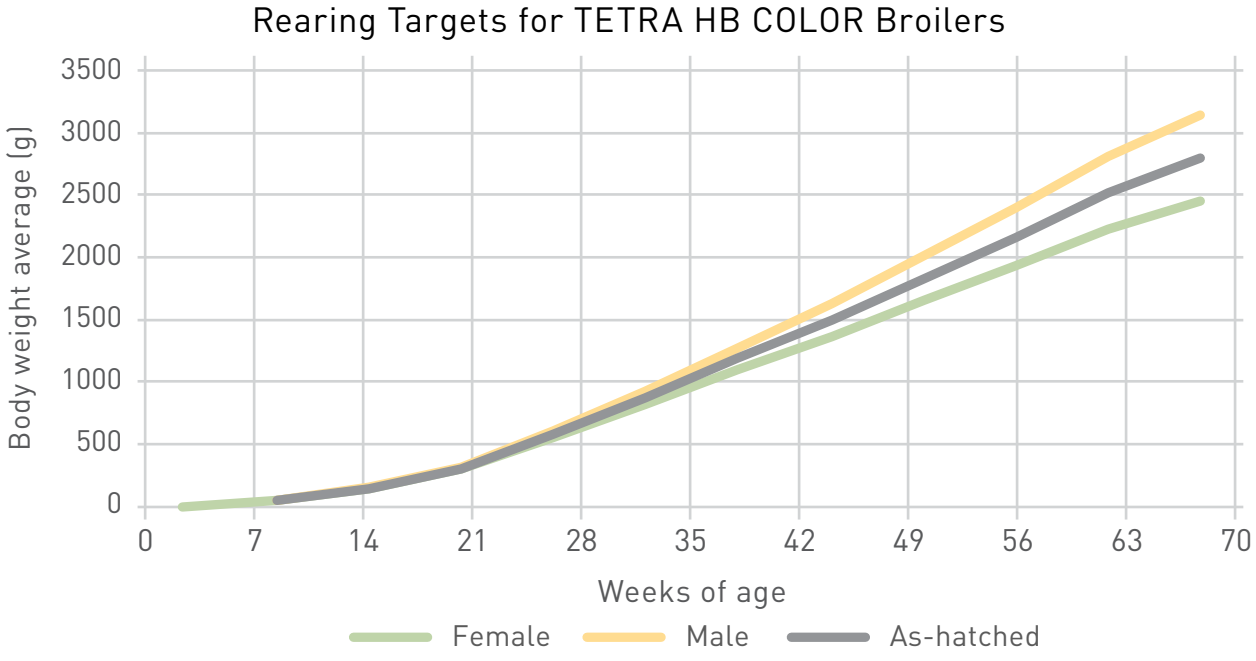
CV%= (standard deviation/ average body weight) x 100

Table 8: Weight Development for TETRA HB COLOR Broilers

Age (days)	Female	Male	As-hatched
	g		
0	41	43	42
7	137	147	142
14	294	313	304
21	558	607	582
28	813	930	871
35	1096	1272	1185
42	1361	1624	1492
49	1653	2006	1829
56	1928	2398	2163
63	2222	2809	2515
70	2450	3142	2795

Table 9: Carcass Yield of TETRA HB COLOR Broilers

Age (days)	Body Weight (g)	Thigh (%)	Breast Fillet (%)
	Female		
49	1600	21.0	14.2
70	2400	21.7	16.7
	Male		
42-49	1600	22.1	13.5
56-63	2800	22.5	15.8



NUTRITION

The genetic potential of TETRA HB COLOR Broilers with high performance can only be exploited when their biological needs are met. Giving complete feed is necessary, with specialized nutrient content adapted to the birds' needs in each growing phase.

The Basics

Energy and Nutrients

Due to the high performance of TETRA HB COLOR Broiler, the demand for nutrients is relatively high and varied. Scientific studies classified up to almost 40 (macro and micro) nutrients to be supplied in appropriate concentrations and ratios.

Energy demand is the most crucial factor. The recorded feed digestion (burning) provides energy for the body, a part of which (metabolizable energy or ME) can be utilized for metabolic processes such as maintenance, weight gain and development.

Proteins and Amino Acids

Protein is the highest proportion of components present in the body and feathers; therefore, it is essential for growth and development. Although it still has great significance in practice, the "crude protein" content has become less valued in scientific circles. Simple laboratory tests (N x 6.25) and rapid tests are available to monitor the protein content of the feed, which is necessary to ensure the reliability of the manufacturing plant.

Protein added to feed is broken down into amino acids, from which the body compiles its proteins, but their genetically encoded amino acid composition and sequence are different. About 20 different amino acids are required, some of which poultry cannot synthesize, known as "essential" amino acids, and those "non-essential" amino acids are only found in a minimal amount in feed. Methionine and lysine supplements are now required in almost all poultry feed, with threonine and valine usually being indicated at the values that set limits on excessive protein reduction. Birds require cysteine for their plumage; however, it can be replaced by sulphur-containing methionine if it is not available.

Fats, Oils, Fatty Acids

Components of fats/oils are fatty acids. Their ratio affects their melting point (solid "fats" and liquid "oils"). All energy provider compounds, like fatty acids, especially linoleic acid, are essential for the growth and development of skin and feathers. The linoleic acid content of maize, sunflower and soybean oil is favourably high.

Minerals

Calcium (Ca) and phosphorus (P) are the most critical components of bones and are also present in other body tissues. Grain-based feeds are poor in calcium, so supplementation of ground limestone (calcium carbonate, 38% Ca) is necessary. However, plants contain a higher proportion of phosphorus, but because of phytate complex, the bioavailability of the P rate is only 10-40%. Previously, a large-scale mineral phosphate supplement was needed, although today, because of the wide-range use of phytase enzyme, P-utilization has improved significantly.

Sodium (Na^+), potassium (K^+), and chloride (Cl^-) ions play an essential role in blood and osmotic pressure, cell pH maintenance and enzyme activation. Sodium supplements with common salt (NaCl) usually satisfy the chlorine demand. In the case of heat stress, sodium carbonate supplementation is recommended. The potassium (K^+) content in plants is already high.

Vitamins, Microelements

Vitamins are micronutrients that are essential for maintaining health and performance. Each vitamin has a separate role, so other vitamins cannot replace it. Vitamins – with few exceptions – cannot be synthesized, so they must be mixed in feed. A few milligrams or micrograms of specific vitamins are sufficient for the supply of vital functions, but these must be provided regularly.

NUTRITION

In today's intensive technology, satisfactory results can only be achieved by a purpose-built vitamin supply.

Trace elements are components of enzymes, each of which plays a crucial role in specific metabolic processes. Regular poultry feeds contain a compound of 13 different vitamins and 7 trace elements; incorporate Vitamin C in the case of increased stress. Particular poultry feed contains the same vitamins and trace elements, but a partial absence of either micro component has a considerable negative impact on health and development.

Other Supplements and Additives

Regular mixing of antioxidants protects vitamins and unsaturated fatty acids.

In recent decades, the exogenous enzymes have caused significant changes, and NSP-degrading (non-starch polysaccharides) enzymes have allowed a higher grade, risk-free mixing of cereals. In contrast, the phytase enzyme has strongly improved phosphorus utilization of plant components and has affected the digestibility of other nutrients favourably.

A balanced feeding program is required to reach targets of weight gain. The **starter** feed is crumbled, and the **grower** and **finisher** are granulated. Mix coccidiostats into feed in different feeding phases to protect the flock against coccidiosis. Except for the last phase of the finisher, pay attention to the withdrawal time. (Table 10)

Table 10: Nutritional Recommendation for TETRA HB COLOR Broilers

Feed Type		Starter	Grower	Finisher
NUTRIENT		**0-27 days**	**28-55 days**	**55-70 days**
Crude protein	%	21.00	18.50	17.50
Met. energy	MJ/kg	12.20	12.50	11.70
Crude fat	%	3.55	4.47	4.86
Crude fiber	%	3.81	3.76	3.85
Lysine	%	1.19	1.01	0.96
Methionine	%	0.52	0.47	0.42
Calcium	%	1.04	0.91	0.99
Phosphorus	%	0.77	0.74	0.64
Phosphorus, av.	%	0.45	0.44	0.45
Sodium	%	0.17	0.15	0.18
Vitamin A	IU/kg	10000	9600	10000
Vitamin D_3	IU/kg	4000	3500	3000
Vitamin E	mg/kg	35.00	30.60	21.00

Do not rush the growth of HT coloured broiler. The feed for commercial broilers is high in protein and energy and not suitable for coloured broilers. Therefore, follow the parameters listed in the management guide. Clean drinking water should always be available, and its quality also must be checked regularly. In the case of chickens reared separately according to gender, pay attention to stocking density. Adjust the daily feed portion to reach the body weight target. Feeding restrictions among males may also be required.

Table 11: Feed Consumption and FCR for TETRA HB COLOR Broilers (0-70 days of age)

	Female	Male	As-hatched
Feed consumption (kg)	6.6	7.8	7.0
FCR (kg/kg)	2.81	2.63	2.72

HOUSING

There are several ways of keeping a TETRA HB COLOR commercial flock.

- Intensive
- Semi-intensive
- Free range/organic

} Alternative methods

Instead of an intensive, semi-intensive system is recommended for coloured broilers as we aim for slower growth, resulting in tastier and firmer chicken meat. Rapid growth and minimal movement will cause health problems and increased fat deposition, especially in females.

If we intend to grow the TETRA HB COLOR flock in alternative systems, keep young chicks inside the building during the brooding period in the first week. This time is needed for the birds to develop their immune system, skeleton and plumage. Chicks can have access to free-range from the second week onwards, but feed and water must be provided inside the building.

Access to pasture areas also improves meat quality and reduces abdominal fat deposition. Up to 20-25% of their daily feed needs can pinch outdoors.

Hot Climate Management

TETRA HB COLOR is capable of excellent performance even in hot climates. However, there are various modifications to the management recommendations for controlled environmental conditions that can be adopted to minimize performance loss.

- When the temperature is hot, schedule feeding for cooler times of the day.
- Reduce the energy content of the feed.
- Feed should be more concentrated due to expected lower appetite.
- Use roofing materials which have good insulation properties and reflect solar radiation. Natural materials like palm thatch usefully reduce the penetration of solar heat.
- Roofs should be as high as possible to minimize the temperature at the bird's level and maximize the natural airflow to the ridge.
- Vegetation and trees may be planted around the buildings to provide shade and reduce the amount of sunlight reflected.

IMPORTANT!

In some countries, welfare regulations may stipulate stocking rates, feeding space and drinking space, which are different to those given in this manual.

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