BARN DENSITY CALCULATION

The amount of space that birds are provided can have a significant impact on performance and animal welfare. Optimal stocking density is significantly affected by housing factors, such as ventilation, litter management, and the method of delivery of both feed and water. It's important to remember that bird welfare and successful performance depend on the complex interaction of several factors.

Chicken Farmers of Canada's maximum allowable density limits are based on the Codes of Practice developed by the National Farm Animal Care Council. Regular density level is set at 31kg/m^2 with the ability to increase density to maximum of 38kg/m^2 at the time of shipping, only when certain conditions are met.

Bird weight is a key factor in planning appropriate stocking densities, which must be calculated using interior dimensions of the available barn space and the expected shipping weight of the birds. In addition, historical farm mortality data is an important tool to predict future mortality and determine placement numbers for the next flock. Consistency is key when monitoring fluctuations in mortality rates as this provides the information needed to adjust chick orders accordingly and mitigate any overcrowding at the end of production.

The formulas used to calculate the maximum number of birds that can be placed in the barn are available in the Animal Care Program manual. There are several parameters used to determine the maximum number of chicks that can be placed in a barn, including:

- Barn floor size
- Target weight
- Maximum density
- Total number of feeders and drinkers
- Manufacturer recommendations for drinkers and feeders
- Estimated mortality

Apart from farm mortality, the parameters listed above will likely remain constant for the foreseeable future. The following shows example calculations for determining the maximum number of birds that can be placed in a barn. Your provincial board can provide an Excel sheet with pre-filled formulas to help with this.

EXAMPLE CHICK PLACEMENT CALCULATION

BARN PARAMETERS

Barn floor area: **733.8 m²** (area accessible to the birds)
Target weight: **2.15 kg**
Farm mortality average for the previous year: **3.6 %**
Maximum density: **31kg/m²**
Total number of feeder pans: **207**
Total number of nipple drinkers: **948**
Manufacturer recommendations for # birds/feed pan: **55**
Manufacturer recommendations for #birds/nipple drinker: **12**

1. BIRD CAPACITY BASED ON MAXIMUM DENSITY AND TARGET WEIGHT

Bird capacity must be recalculated when changes to target weight and maximum density are made
= (Total floor area × maximum density) ÷ target weight
= (733.8 m^2 × 31 kg/m^2) ÷ 2.15 kg
= **10,580 birds**

2. BIRD CAPACITY BASED ON THE FEEDERS

= (total number of feeders) × (recommended number of birds/feeder)
= (270 feeders) × (55 birds/feeder)
= **11,385 birds**

3. BIRD CAPACITY BASED ON THE DRINKERS

= (total number of drinkers) × (recommended number of birds/drinker)
= (948 drinkers) × (12 birds/drinker)
= **11,376 birds**

MAXIMUM NUMBER OF CHICKS THAT CAN BE PLACED

Use the **lowest bird capacity** as determined from one of the three calculations above
= (lowest bird capacity) × (100) ÷ (100 - estimated percent mortality)
= (10,580 birds) × (100) ÷ (100 - 3.6)
= **10,975 birds**

While there isn't a specific number of flocks necessary to compute estimated mortality, we recommend using farm mortality data from the previous year. Other parameters that may impact flock mortality could include recent disease status, chick quality, and season, among others.