Computing the Amount of Salmon to Load Into a Tank

Before putting salmon juveniles into a rearing tank, the carrying capacity of the tank must be determined. The volume of the tank, water temperature, water flow rate, and the size of the fish area factors that determine the amount of fish to stock a tank hold and keep the fish healthy and growing. Too many fish will lead to poor growth, disease, and mortalities, not only in the tank, but also after the fish are released into the ocean. Salmon smolt (the life stage when salmon enter the ocean) must be must be thriving and capable of capturing feed and avoiding predators. Good hatchery practice will enable this to happen. The loading equation to determine the amount of fish to load into the pond is:

Step 1: Compute R = Water flow rate in m^3/hour divided by the tank volume in m^3

Step 2: Kg of fish/m^3 = 1 kg of fish /liter of water flow per minute) x (R/.06)

Step 3: Kg of fish loaded into the tank = kg of fish/m^3 x volume of the tank in m^3

To calculate loading capacity of a tank, the following data is needed:

R is the number of water volume exchanges per hour in the rearing. For example, if the volume of the container is 2 m^3 (cubic meters) and the water flow rate into the tank is 4 m^3/hour, R is 4 m3/hour/2 m^3= 2 exchanges per hour. Put simply the flow rate has the capacity to fill and empty the tank twice in one hour.

.06 is the volume in cubic meters of a flow of 1 liter/minute during a 1 hour period (60 minutes x 1 liter/minute = 60 liters, and the 60 liters converts to .06 m^3)

Example:

Data

- Measured flow rate of water in the tank is 800 m^3/hour
- Tank with a volume of 200 m^3

Calculation

- Step 1 R= 800 m^3/hour/ 200 m^3 or 800/200 = 4
- Step 2: Kg of fish/m^3 = 1 kg of fish/liter/minute x (4/.06) or
  - 1 x 4/.06 = 66.66 kg of fish/m^3
- Step 3:66.66 kg of fish./m^3 x 200 = 4.444 Kg

This is the loading capacity, but you will not load the fish in at this level because this is the 100% capacity level and will exceed the carrying capacity with any additional growth. The general recommendation is to load about 70% of the 4,444 kg or: 3111 kg of fish loaded.