

Factors influencing Parasitic Prevalence

Epidemiology is the **study of diseases** or infections in host populations and the **factors** that determine their occurrence.

Understanding the biology and epidemiology of parasites of hosts is essential to improve the control measures and decrease in production losses.

The epidemiology of parasites is governed by **parasite-host relationship** and **reaction with environmental conditions**.

The prevalence and distribution of parasites are largely governed by a combination of their **ecological requirements** for development and survival outside the host and management practice.

The epidemiology of parasites can be studied taking into consideration the overall prevalence (overall, seasonal, age-wise, breed-wise, host wise) and the associated risk factors with GIT parasites.

- 1. Overall Prevalence**
- 2. Age wise prevalence**
- 3. Gender wise prevalence**
- 4. Breed wise Distribution**
- 5. Seasonal Prevalence**

Risk factors

- 1) Poor nutrition:**
- 2) Feeding range:**
- 3) Poor health infrastructure and medication:**
- 4) Proper Anthelmintic Use:**
- 5) Parasite ecology:**
- 6) Feeding Management:**
- 7) Lack of Clean or Safe living areas:**
- 8) Multi-species feeding:**

9) Management of living area:

Following are the definitions given by Margolis *et al.* (1982) and Bush *et al.* (1997) for calculating Infection statistics.

$$\text{Prevalence} = \frac{\text{Total number of hosts infected with parasites}}{\text{Total number of hosts examined}} \times 100$$

$$\text{Mean Intensity} = \frac{\text{Total number of parasites}}{\text{Total number of hosts infected}}$$

$$\text{Relative Density} = \frac{\text{Total number of parasites}}{\text{Total number of hosts examined}}$$

The presence or absence of a number of **biologic**, **chemical** and **physical** factors in the environment directly or indirectly affect the parasitic prevalence.

- **Flora:** Vegetation that serves as food and shelter for hosts, both intermediate and definitive, greatly influence parasite population.
- **Fauna:** Since parasitism can occur only if two different species of organisms enter into a relationship, the presence and abundance of the host species are of critical importance.
- **Water:** Water plays a major role in the maintenance of many types of parasitic fauna *e.g.*, Mosquitoes, Molluscan hosts, Miracidium, Cercaria etc.
- **Host Population Density and Behaviour:** Population densities of transport, and intermediate and definitive hosts affect the parasite population density, for the latter is directly dependent on the former. In addition to population densities, feeding and other behaviour patterns of hosts affect the parasite density.
- **Influence of Season:** Fluctuations in both the number and kind of parasites occur throughout the seasons.

Following **demographic** and **social** characteristics are associated with parasitic prevalence.

- ✓ **Parasite type:** *Ascaris lumbricoides* is more in children population than *Trichuris trichura*, *Enterobius vermicularis* & *Taenia saginata*.
- ✓ **Host specificity:** One of the most fascinating aspects of parasitism is the phenomenon of host specificity. Host specificity is defined as the adaptability of a species of parasite to a certain species or group of hosts. The mechanisms responsible for host specificity are not completely known but are undoubtedly complex and varied, for the degree of specificity differs from species to species.
- ✓ **Ecological aspect:** The prevention of infection in nature due to ecological barriers is known as **ecological non-specificity**, and the ability of a parasite to infect a compatible host as a result of ecological opportunity is designated **ecological specificity**.
- ✓ **Age group:** Prevalence will be more in more vulnerable age groups *e.g.*, children playing in open than children indoors.
- ✓ **Gender:**
- ✓ **Food preferences of the Host:**
- ✓ **Resistance of the host against infections:**
- ✓ **Locality:** Prevalence is more in polluted localities / localities having parasite stages available
- ✓ **Water source:** Using untreated (river, stream, well) water will cause more prevalence than using treated (Tap) water
- ✓ **Educational status**
- ✓ **Defecation sites:** Defecating in open means more prevalence as infective stages are available for infection and re-infection.
- ✓ **Personal hygiene:** Hygienic individuals will have less prevalence than unhygienic organisms.

If the prevalence of infection is to be controlled, then all factors, which are contributing in getting infection, have to be checked properly.