Blowflies are a major problem for the Australian sheep industry. The problem is complex because it involves an interaction between climate, sheep, fleece and flies. Many facets of the interaction have been studied, but there has been little integration of these into a coordinated approach to blowfly control and research. This paper suggests one such approach.

Blowfly strike of sheep can be represented as part of the fly life cycle (Fig. 1). Our objective is to identify and quantify important factors promoting progression through the cycle so as to be able to predict the timing and impact of one particular part of the cycle viz. the development of fly larvae on sheep or 'strike'. In Fig. 1, some of the factors believed to be important for the development of body strike are listed; for other types of strike, factors have similarly been identified. The aim is to replace each arrow in the cycle with a mathematical equation describing the development of the succeeding stage in terms of the factors affecting that transfer. Information on the quantitative importance of the various factors is fragmentary and needs to be supplemented by further research.

Construction of this model offers several practical advantages. Firstly, during development of the model, research requirements are indicated. Details of the fly population and the occurrence of fly strike can be predicted when the major factors affecting the fly life cycle are known. If such predictions prove to be inaccurate, further research is required to reassess the influence of known factors and seek for previously unknown factors. Secondly, applications to fly-strike control are possible. When sufficient data on the sheep-fly interaction are available, the time and extent of fly interaction with sheep, i.e. 'strike', can be forecast; major factors promoting flystrike will be identified and can be made the target of control measures; and, the efficacy of flystrike control measures can be assessed by determining their influence on the fly life cycle.

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