In the Netherlands enormous numbers of farm animals are kept in so called intensive husbandry systems. Many of these animals show abnormal behaviours like tongue playing of crated veal calves, bar biting of tethered sows, sham-dustbathing of hens in battery cages. What is the meaning of this type of behaviour in terms of animal welfare? To answer this a regulatory model of behaviour is described in which Sollwerte play a key role. In vertebrates these Sollwerte are realized by flexible behaviour programs. Against this background the origin of abnormal or disturbed behaviour in farm animals is described. A central idea is that vertebrates try to control or to predict Umwelt changes and by this secure a state of welfare. Some form of awareness in animals behaving this way has to be assumed. It is discussed why (farm) animals probably have feelings (emotions) and for what purpose they even need such feelings. Finally a relationship is described between behaviour and abomasal lesions in veal calves demonstrating the necessity and usefulness of welfare research on the level of individuals.

INTRODUCTION

Nowadays, 14 million people live in the Netherlands. All these human beings in fact inhabit a relatively small area, at a population density of about 419 people per km². For the greater part, the prosperity of this dense human society depends on, or is closely associated with, a system of intensive food production located within this same area. Part of this food, for instance meat, eggs and milk, is produced by vertebrates: farm animals, which are present in enormous numbers (cf. fig. 1). These animals, their behaviour and their welfare are the scope of this paper.

The factors that determine Dutch (and other West European) husbandry systems are of two kinds. The first and more dominating set includes those directed at maximizing profits (productivity) and minimizing costs (for labour, buildings, energy and others). These factors are quite obvious in view of the powerful economic interests involved. Their impact has transformed many farms into industriallike projects, in which the adaptability of the animals involved has scarcely been taken into account. This adaptability refers to the second set of factors relevant in livestock housing: the biological ones.
The economic and biological determinants do not appear to balance each other; as a rule the former strongly predominate. However, both are of utmost importance: the economic factors because they have massive human involvement from farmer and society, and biological ones because they reckon with the less measurable, but nevertheless real interests of a huge number of individual animals. Since the relations between both points of view are often strained, an ethologist, wishing to apply his knowledge to establish more adequate housing conditions for farm animals, must be simultaneously careful and resolute. Careful, by not damaging without good evidence the interests of farmers and their animals. Resolute, by not postponing statements that can and must be made today.

Under modern housing conditions farm animals frequently perform behaviours that an ethologist is inclined to describe as abnormal or disturbed. By this means, questions are raised on animal welfare. This contribution deals with what an ethologist may say on the biological significance of abnormal behaviours. Do such behaviours give some insight into animal welfare problems? Some years ago BAERENDS (1978) made a first attempt to discuss human welfare problems from