

## Cognition and Welfare of the Pig

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### Introduction

Concerns about the welfare of pigs and other farm animals are growing and it is frequently suggested that modern production practices may cause physical and mental suffering to animals. Criticisms such as these are based on underlying beliefs that animals have mental capabilities that enable them not only to be aware of what is happening to them, but to also have a vested interest in how they are treated. This consequently determines whether they experience positive or negative emotional states. Presumably, then, if pigs are treated in ways that they find to be aversive, and over which they have no control, they are as likely to suffer physically as psychologically, and this in turn may reduce the level of welfare they experience [3,14].

### Objectives

- Define animal welfare and cognition
- Give examples of cognitive abilities pigs may possess.
- Explain how a pig's cognitive abilities may be related its level of welfare.

### Understanding animal welfare and cognition

To understand how animal welfare may relate to cognition, one must first understand what "welfare" means. One definition is that "welfare is the animal's state in regard to its attempt to cope with the environment" [1]. However, a pig's welfare level depends not just on whether it is coping well enough so as to be physically healthy. It also matters whether the pig can behave normally, and how it correspondingly feels, i.e., whether it is experiencing positive emotional states or unpleasant subjective states like fear or frustration [2]. Unpleasant emotional states or "feelings", particularly for extended periods, are likely to be associated with suffering, a negative affective state typically associated with poor welfare [3, 4]. Subjective emotional states or feelings are reflections of the animal's capacity for "cognition." Cognition also includes all mental processes used to acquire, store, process, recall and use information [5]. Most people believe that animals have feelings even though these are difficult to demonstrate scientifically. Recently, though, investigations of farm animals' emotional states have begun [4]. Scientists are especially interested in understanding how animals' subjective emotional states may interact with their motivation to behave in certain ways [2].

## Cognitive abilities of pigs and their implications for production management

Cognitive processes such as learning, memory, and problem-solving are essential for animals to adapt to complex, dynamic environments [6]. Because the pig's psychological processes may impact its physical well-being in a given environment, there are practical reasons for producers to be aware of these. For example, understanding pig cognition may help producers better identify and minimize instances in which suffering is likely to occur [3].

Pigs have been shown to be capable of fairly complex cognitive processes, such as operant learning in which they work to control lighting and other sensory aspects of their environments [7]. Pigs also can solve problems requiring them to grasp rules and relationships [8], and can learn gestural and verbal [9], visual [9-11] and olfactory discriminations [11]. Pigs have also been shown to be capable of spatial and social learning and memory [12-13].

Because pigs have these abilities, they may be able to learn and remember aversive events (such as painful procedures), or develop expectations from their environments that may not be met, and suffer accordingly. For example, production environments that are relatively barren may provide pigs with inadequate mental stimulation, which may cause them to experience psychological distress or suffering in the form of boredom, frustration, and other unpleasant emotional states [14]. For the producer, this is problematic because psychological and physical stressors evoke similar physiological mechanisms [15]. Thus, a pig experiencing psychological distress may also experience harmful physiological consequences, especially if its stress response is chronically activated [16].

Moreover, boredom and frustration arising from unfulfilled mental needs may lead to undesirable behaviors, such as redirection of normal oral behavior by biting and chewing on available objects (e.g., the ears and tails of other pigs) [17]. This can lead to wounding, bleeding, infection, illness and even death, all of which are counter-productive and detrimental to welfare. Other undesirable behavior patterns, such as stereotypies (e.g., repetitive tongue-rolling), reduced responsiveness to environmental stimuli, and inappropriate social behavior may develop as a result of a mismatch between pigs' mental abilities and the quality of their environments.

### Summary

Responding to the public demand for improved food animal welfare requires attention to all of the factors that impact a pig's welfare. Although producers typically focus on the pig's physical and physiological needs, its behavioral and mental needs must also be understood and considered because these matter to its well-being. Although the pig's emotions may not be easily investigated, and may seem to be irrelevant to production, they are related to its welfare, and probably, indirectly to its productivity. Other cognitive abilities which have been scientifically demonstrated (e.g., the pig's learning and memory capabilities) could be used to improve aspects of their management, handling, and, in turn, well-being. For example, producers must continue to minimize circumstances that cause distress, such as rough or inappropriate handling. However, they may also consider modifying the environment by housing or grouping pigs in ways that permit behavioral and mental stimulation as well as normal social behavior. While modifications need to be carefully implemented so as to remain practical, safe and economical, simple adjustments may result in benefits for the pig's production levels as well as its physical, physiological, behavioral and psychological welfare.

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