Topic Summary for Stereotypic Behaviours in Pregnant Sows

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A stereotypy is a behaviour that does not appear to serve any function, is distinct from an animal's natural behaviours, and is repeated multiple times (Terlouw et al., 1991; Spoolder et al., 1995). An animal will be predisposed to perform a stereotypy if they are in an environment that is lacking natural stimuli, such as restrictive spaces or areas with food limitations (Terlouw et al., 1991; Zhang et al., 2017). Pigs are curious animals and investigate their enclosures through natural nosing and rooting behaviours (Zhang et al., 2017; Radkowska et al., 2020). If these motivations are repressed, pigs may develop stereotypic behaviours (Whittaker et al., 1998; Radkowska et al., 2020). Sow stereotypies include bar manipulation, chain manipulation, head-waving, and sham-chewing or vacuum chewing (Van der Peet-Schwering et al., 2003; Radkowska et al., 2020). Stereotypies can be identified using observational sampling and ethograms, which list and define all the behaviours that an animal displays (Spoolder et al., 1995; Tatemoto et al., 2020). Scan sampling or all-occurrence sampling can be used in-person or on video recordings to determine the frequency of stereotypies or the amount of time sows spend performing behaviours (Whittaker et al., 1998).

Research on stereotypies in sows is primarily directed toward causative factors, including restrictive housing or feeding (Radkowska et al., 2020). In terms of dietary constraints, Bergeron et al., (2000) and Van der Peet-Schwering et al., (2003) investigated the effects of fibre in mitigating stereotypies. This involved manipulating the diets of two treatments of sows and observing how stereotypies were impacted. Both studies found that high-fibre diets resulted in a lower frequency of stereotypic behaviours. Similarly, Terlouw et al., (1991) and Bergeron and Gonyou, (1997) tested the effects of increasing the energy in sow diets and found that high energy diets with more calories decreased stereotypic behaviours. In an effort to further determine how gestation diets influenced stereotypies in sows, Robert et al., (1997) altered bulkiness of the diets in two different treatments and found that bulkier diets were more effective at mitigating stereotypies. These studies provide support for feeding restriction as a contributing factor of oral stereotypies and demonstrate that increasing dietary bulk, fibre, or energy can effectively reduce feeding motivations in sows.

Other studies investigated how the presence of a foraging substrate impacted stereotypic behaviour. Spoolder et al., (1995) and Whittaker et al., (1998) both found that the presence of straw decreased oral stereotypies displayed by sows. They suggest that straw provides an outlet for foraging behaviour and decreases feeding motivation. This research also questioned whether compulsive rooting behaviour in straw could be considered a stereotypy in itself.

Terlouw et al., (1991) and Zhang et al., (2017) both looked at confinement as a contributing factor and found that sows living in restricted spaces displayed higher frequencies of stereotypies. This provides support for the mitigation of stereotypies through group-housing sows or providing larger enclosures.

Another important area of research focuses on stereotypies as a welfare concern. Previously, studies questioned whether stereotypies were detrimental to sow health, as they appear to be adaptive in reducing stress (Spoolder et al., 1995). To determine effects of stereotypies on the endocrine system, Zhang et al., (2017) analyzed blood samples from sows that were highly confined and found that stereotypic behaviour triggers a nonspecific immune response which releases cytokines. They concluded that although initially adaptive, stereotypies can permanently damage an animal's stress response in the long-term. This concern has recently become more prominent within the scientific community and animal welfare associations. Radkowska et al., (2020) states that in domestic animals, stereotypies are associated with frustration, depression, and poor welfare, and group-housing is now considered a requirement for sow welfare due to its mitigating effects on stereotypies (National Farm Animal Care Council, 2014). New research also suggests that stereotypies can have broader consequences, as they may impact developing offspring (Tatemoto et al., 2020).

In terms of further research, specific brain functions and epigenetic factors associated with stereotypic responses in animals have not yet been discovered (Radkowska et al., 2020; Tatemoto et al., 2020). Future experiments could identify genetic and hormonal influences on stereotypic behaviour, and if foraging substrates are beneficial for long-term animal welfare (Whittaker et al., 1998; Radkowska et al., 2020).

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