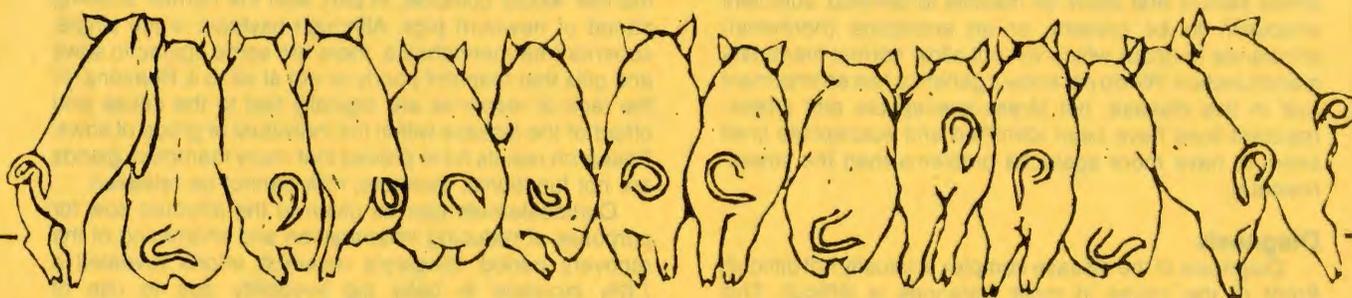


HEALTH

Pork Industry Handbook



Mastitis, Metritis, Agalactia (MMA)

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Swine agalactia (in the past commonly referred to as MMA or mastitis, metritis, agalactia) is a disease syndrome that results in death of baby pigs through starvation and an increased susceptibility to other fatal diseases of the newborn. This disease is of major importance to the pork producer because of its economic impact. The typical swine agalactia syndrome occurs in the very early stages of lactation. If the herdsman or attendant has been trained to recognize the signs, it may be evident to him at farrowing. Total lack of milk (agalactia) does not occur as frequently as a reduction in normal amounts of milk (hypogalactia). The latter can easily be overlooked; and the assumption that the baby pigs were born weak is often believed as truth when, in reality, the pigs are slowly starving. The number of sows or gilts affected with this disease syndrome during a farrowing period in a given herd varies from 0% to 100% with an average of 13.1%.

Signs and Symptoms

The disease complex can be present at farrowing time or can appear within several days after parturition. Signs or symptoms observed in the sow or gilt may include rapid breathing, depressed attitude, lack of desire to eat or drink, fever, reluctance to move about or to allow nursing. When the herdsman observes uncomfortable baby pigs, it indicates the need for closer evaluation of the sow. The mammary glands of the sow or gilt are more frequently involved than any other body part. The amount of involvement varies from only one gland to the entire udder. The affected mammary glands are usually enlarged, more firm, warmer, more sensitive, and are often discolored when compared to the other glands. Careful palpation of the mammary glands of each sow several times during the early postpartum period may reveal developing

hypogalactia and allow for treatment early in the syndrome. The presence of a purulent discharge (pus) from the birth canal does not necessarily indicate that the sow or gilt has metritis. Studies have revealed that over 60% of clinically normal sows have a discharge. Postmortem examinations of sows with agalactia have indicated that the incidence of metritis is very infrequent in this disease condition.

Tissue changes within the affected sow are variable because of the different causative agents or management factors involved. Lactation failure (agalactia) can be a primary disease or secondary to other diseases. The majority of affected animals will reveal abnormal mammary gland tissues. The changes may be characteristic of mastitis or of a partially functional gland without mastitic changes.

The area of mastitis within a gland is frequently small and has created investigator comments that the degree of mastitis could not produce the signs within the sow or the starvation in the baby pigs. The partially functional or nonfunctional gland looks and feels very similar to the gland with mastitis, which makes an accurate diagnosis difficult. The partial or nonfunctional status is believed to be the result of some insult to the hormonal sequence of events necessary to mammary gland secretion. The primary mammogens—estrogens, progesterone and prolactin—along with a number of direct and indirect synergistic hormones, are essential to full development and secretion of milk by the mammary glands. Each of these hormones must be present at the right time in the right amount to initiate and maintain lactation. Anything altering the levels of the hormones—for example, environmental stress, poor nutrition, bacterial endotoxins or improper preventive injections—can affect lactation. Other body tissue changes usually involve swelling,

redness and possibly hemorrhages in tissues around and in the mammary glands, associated lymph glands, kidneys, synovial membranes, adrenal glands and, in some instances, the pituitary gland.

The actual cause(s) of agalactia have been narrowed from the 30-plus previously stated in the literature. All or any of those factors can be involved as contributors or stress factors that allow for mastitis to develop, sufficient endotoxin to be present, or an endocrine (hormonal) imbalance to occur which will not allow normal mammary gland function. We do not know if genetics has an important role in this disease, but stress-susceptible and stress-resistant lines have been identified and susceptible lines seem to have more agalactia problems than the stress-resistant.

Diagnosis

Diagnosis of the disease complex is usually not difficult. Proof of the cause in most instances is difficult. This disease must be differentiated from others such as transmissible gastroenteritis (TGE) or pseudorabies (Aujeszky's or PRV) to allow for the effective treatment and/or control measures to be instituted. Evaluation of history, observation of symptoms, palpation of the sow mammary glands plus postmortem examination of one or several pigs will usually allow for a definitive diagnosis.

Culturing of milk samples should be considered and, if done correctly, can reveal valuable information about a particular sow herd. Although treatments cannot be postponed until culture results are obtained, they can be changed after culture results are known if the initial treatment is not appropriate for offending organisms. Other clinical tests on an individual sow will not sufficiently enhance diagnostic efforts to be economically justified. Expanded testing when the disease involves many sows is justified to assist in determining preventive measures and in eliminating other infectious diseases. The future may reveal more rapid capabilities in determining endotoxin and endocrine levels at, it is hoped, affordable costs.

The associated veterinarian is in the best position to coordinate the diagnostic procedures in a particular herd, particularly if he/she is involved routinely in the overall swine production unit. The herdsman and the veterinarian should work together to characterize a particular situation completely and thus reach a rapid solution. An accurate diagnosis leads to treatment(s), the initiation of possible preventive measures, and the ability to make an accurate prognosis.

Prognosis

The prognosis for the life of the affected sow or gilt is good. The prognosis for the complete return or establishment of normal lactation is guarded. The affected sow usually recovers in 2-5 days with or without lactation function. Having the disease once does not mean that the sow will develop agalactia on subsequent farrowings. Unless sow lactation is rapidly re-established or supplemental feeding is successful, the chances for baby pig survival are low. The effects of chilling, diarrhea and other baby pig diseases must be fully considered.

Treatments

Affected sow treatment(s) must be directed toward establishing milk flow to aid in sustaining life of the pig while preventing secondary complications in both the sow and pig. No single treatment is superior to oxytocin, which expresses and/or releases the milk within the mammary glands which will be taken by the hungry pigs if they are

strong enough to nurse. The principle involved is no different from the often recommended frequent milking of the mastitic dairy cow for "clean out" purposes. Multiple injections of oxytocin may be necessary to provide milk for the pigs. The biological half-life of oxytocin is 6-7 minutes; therefore, injections can be given every 2-4 hours without being harmful to the sow. Timing of the injections in that manner would coincide, in part, with the normal suckling period of newborn pigs. Although oxytocin is the single, superior treatment choice, there are some agalactic sows and gilts that respond poorly or not at all to it. Reasons for the lack of response are logically tied to the cause and effect of the disease within the individual or group of sows. Research results have proved that many mammary glands are not functional; therefore, milk cannot be released.

Corticosteroids can be given to the affected sow for purposes of reducing inflammation and shortening of the recovery period. Ringarp's research efforts revealed a 7.6% increase in baby pig liveability due to use of corticosteroids with oxytocin and antibacterials.

Antibacterials should be used in treating the affected sow since there is no immediate method for determining the presence of bacterial pathogens. Use of the antibacterials does increase producer costs and forces withholding treated animals from slaughter; however, the added economic burden is justified because of the prevalence of or potential for bacterial infections.

Treatment considerations for the sow *might* also include:

- Estradiol benzoate injection to produce higher pituitary prolactin levels. Estrogens in high doses retard lactation in some species.
- Phenothiazine derivative tranquilizer injections have a lactogenic effect through certain hormone-releasing factor changes. This has been proved *only* in man, rabbits and rats. The excitable, agalactic sow is an excellent candidate for these drugs.
- Injectable laxatives for the constipated sow are indicated. Mild, slow-acting laxatives are preferable and generally cannot be expected to enhance sow recovery in sufficient time to prevent starvation of baby pigs. Mineral oil administered via stomach tube might be considered; however, stress from the necessary restraint will be harmful.

The use of vaginal or uterine infusions, douches, or pessaries to combat suspected uterine infections may stimulate a neuro-hormonal reflex action that could result in posterior pituitary release. However, this action is not different from injecting oxytocin and, in the opinion of the authors, should not be done because of the possibility of contaminating the reproductive tract with pathogenic bacteria.

The basic sow treatments of oxytocin, corticosteroids and antibacterial agents generally produce some desirable results and are frequently the only products used.

Treatment(s) must always consider and probably include supplementary dietary support for the pigs because they have small energy storage capabilities; therefore, nourishment is critical for sustained life. Supplemental heat (85-90 F.) for the baby pigs during the first few days is energy-conserving to them and will aid in survival as a part of routine treatment or prevention.

Prevention

Prevention centers around herd health management and nutrition. The veterinarian should be thoroughly familiar with the total management practices of a particular

farm before attempting to offer suggestions for prevention of swine agalactia. The veterinarian who is consulted only when a sow is ill and not throughout the total breeding and farrowing program is handicapped in offering constructive suggestions.

Immunization procedures, if feasible, must be done in advance of anticipated problems such as bacterial mastitis. The cultures from infected sow's milk can be used to prepare a bacterin. Those herds where bacterial mastitis occurs frequently may benefit from immunization if other management practices will not overcome the problem.

Efforts to reduce stress throughout gestation, especially near parturition, are important preventive measures. An example would be sow acclimatization to the farrowing facility. Use of a new or remodeled farrowing house for the first time frequently brings about agalactia in some sows. One could also wonder about acclimatization of the herdsman owing to the fact that some "outbreaks" are thought to have been human-induced by noise factors, schedule irregularities, etc.

Gestational feeding of sows and gilts has an influence on incidence of agalactia. The underfed sow apparently cannot maintain blood glucose levels as well as the adequately fed sow; therefore, resistance may be lower. Pork Industry Handbook (PIH) 23, concerning gestation

and lactation rations, should be consulted. Ration substitutes are given if constipation is a problem. Additives to reduce mammary gland edema might be considered in some herds. The mixture of 12 parts potassium nitrate NF, 4 parts methenamine USP, and 1 part dicalcium phosphate by weight, given at the rate of 1 oz. twice daily 1 week prior to and 1 week following farrowing may be helpful.

Management attention to controllable environmental factors in the farrowing house is commanded. High humidity and temperature around the sow or gilt should be avoided. Provisions for heat lamps, heat pads, etc., should be available for the baby pigs, but away from the sow.

Preventive research efforts related to various drugs and hormones fed and/or injected prior to farrowing have occasionally produced excellent clinical results. However, critical evaluations and continued study prove that what works in one herd may have no value in another. The future may reveal the usefulness of prostaglandins in agalactia prevention. This parahormone is not approved for use in food animals in the United States at this time.

Swine agalactia is a complex disease syndrome requiring much consideration and effort to produce acceptable results in prevention and/or treatment within the industry. Research efforts are continuing, and newer knowledge will be reported as learned.

