

## **A Case of Superfoetation in a Large White Sow**

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**Abstract:** We report a case of superfoetation in a 3 year old pluripara large white sow which was mated twice at 21 days interval following heat detection on each occasion. Pregnancy was diagnosed using the managerial method of non return to estrous after the second mating. At the end of an uneventful pregnancy, the sow farrowed 2 sets of piglets 30 minutes apart. The first set was made up of 2 immature stillbirth piglets with slimy skin and the second set was made up of 4 piglets, the first being a stillbirth with normal features and the rest normal and healthy. The age of the fetuses was determined using the crown rump length (CRL) method, and the first set of piglets were aged 93 days while the second set were aged 114 days. Further studies showed abnormalities in the dentition, the nostrils, the ears and the internal organs of the immature stillbirths. The case was diagnosed as superfoetation due to the mating interval (corresponding to return to oestrus), and the birth of piglets with varying gestational ages.

**Keywords:** Crown rump length, Immature, Piglets, Still birth, Superfoetation.

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### **I. Introduction**

Superfoetation is a reproductive phenomenon said to occur when an animal shows signs of estrus and is mated during pregnancy resulting in a second pregnancy, in addition to the previous one [1, 2]. Therefore, at least two fetuses resulting from different ovulation cycles and conception times would be present in the uterus at the same time [1]. The criteria for the occurrence of superfetation include; postconception ovulation, deposition of viable semen, polyovulation followed by the delayed implantation (hibernation) of one blastocyst and the ability of the endometrium to anchor the trophoblast for implantation [2-4].

Superfoetation has been reported in several domestic animal species such as the sow [5, 6], the rabbit [7], the ewe [5, 8], the buffalo [9], the queen cat [10, 11], and the cow [12-14, 18].

In the sow, there have been reports of superfoetation by several authors [5, 6, 16 -19] who gave a range of mating intervals (16 – 58 days) and a range of parturition intervals (14 – 68 days).

The implication of superfoetation may include embryonic degeneration as reported by [20]. This may occur due to the accelerated attempt of the developing embryo at reaching the same stage as the more chronologically advanced uterine environment.

In this study, we report a case of superfoetation in a 3 year old pluripara large white sow.

### **II. History**

#### **2.1 Oestrus and breeding**

A 3 year old pluripara large white sow came on estrus and was successfully crossed with a Duroc boar. The sow was observed to be showing obvious sign of estrous again, exactly 21 days later, and was subsequently crossed with the Duroc boar by the farm attendant. The animal was confirmed to be pregnant using management method (non return to estrous) after 21 days following the second mating.

#### **2.2 Parturition**

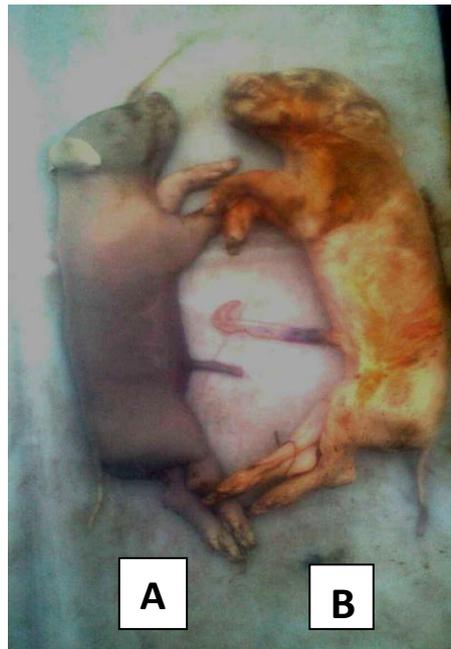
The gestation period was uneventful. At 114 days following the first mating, and 93 days after the second mating, the sow farrowed six piglets. The piglets were farrowed in two sets, about 30 minutes apart. The two sets of piglets were observed to be at two distinct stages of gestational development. The first set, made up of 2 piglets, were born dead (still birth) with hairless and slimy skin. The second set was made up of 4 normal piglets with typical skin appearance. The 1<sup>st</sup> piglet in this set was a stillbirth while the rest were farrowed alive.

### **III. Foetal Development Assessment**

A comparative assessment of the piglets was carried out. Each stillborn piglet was carefully evaluated and developmental features/characteristics such as crown rump length (CRL), organ conformation, etc were recorded as summarized in Table 1. The immature stillborn piglets (from the first set) as well as the mature stillborn piglet (from the second set) with their internal organ conformation are shown in figs. 1, 2 and 3.

**Table 1:** Developmental Characteristics and Parameters of the Piglets

Characteristics	Immature Stillbirth Piglet	Mature Stillbirth Piglet
Crown Rump Length(CRL) [Average]	16.2 cm	24.6 cm
Heart	Not developed	Developed
Dentition	2 upper incisors and 2 lower incisors present. Canine teeth absent.	2 upper incisors and 2 lower incisors present. 2 canine teeth present.
Internal Organ Conformation	The abdominal and thoracic organs not distinguishable	Normal organ structures
Testes	Not descended	Descended
Mammary glands	Not visible	Very visible
Nostrils	Closed	Open
Ears	Shorter and closed	Larger and open
Hair coat	Absent	Present
Tail	Shorter	Longer
Limbs	Shorter	Longer



**Figure 1:** Immature and mature stillbirth piglets. ('A' was farrowed in the first set while 'B' was farrowed in the second set).



**Figure 2:** Indistinguishable internal organs of the immature stillbirth piglet (from the first set of piglets).



**Figure 3:** Distinguishable internal organs of the mature stillbirth piglet (from the second set of piglets).

#### **IV. Estimation Of Gestational Age**

Crown rump length (CRL) was used to estimate the gestational age of each piglet according the method of [21] using (1):

$X = 3(Y + 21)$ , where, X = developmental age in days,  
and Y = crown to anus length in centimeters

The crown rump length or the crown- anus length was measured using a measuring tape in centimeters from the crown of the piglet's skull to the point of the rump. The crown rump length of the mature piglets was 24.6 cm while that of the immature piglets (stillbirth) was 16.2 cm. Using (1) above, the gestational age of the first set of piglets (immature stillbirth) = 93 days (less than the normal gestational length for pigs). The gestational age for the second set of piglets (mature piglets) = 114 days (normal gestational length for pigs).

The difference in days between 114 days and 93 days is 21 days which falls within the range of 18 – 21 days for return to estrus in sows.

#### **V. Diagnosis**

Following the observations made, the case was diagnosed as superfoetation.

#### **VI. Discussion**

The occurrence of superfoetation as seen in this case may be related to the findings of [22] who reported that the signs of heat, reception and successful mating are required for the establishment of a second pregnancy.

Throughout the gestation period, the pregnancy was uneventful. This could be probably due to the maternal uterine space which may have finite capacity to gestate offsprings [23].

Variations were observed in fetal measurements and size as well as organ development in the piglets. The immature stillbirths showed abnormal internal organ conformation (Fig. 2) while the mature stillbirth piglets had normal internal organ conformation (Fig. 3). The mature normal piglets which were farrowed alive were apparently healthy and assumed to have normal internal organs. This could explain their survival till date. The indistinguishable internal organs of the immature still birth piglets could have been as a result of asynchrony between the embryo during development and the more chronologically advanced uterine environment [20], differences in fetal age between the mature and immature piglets as well as their varying access to nourishment.

In the present case, it was observed that the interval in the birth of the two litters of piglets was 30 minutes. This is completely different from the reports of other authors. [16] reported a case of superfoetation in a Chester White sow with parturition interval of 25 days. [18] described a case of probable superfoetation where two litters were produced 37 days apart while [19] and [6] reported birth intervals of 14 days. The rather very short interval observed in the present case explains the conditions of the first set of farrowed piglets which could not attain the normal gestational age of 114 days.

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