

## Dystocia impacts on the fetal viability in local breed Goats

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### Abstract:

**Background:** Dystocia could be described as persistent and troublesome parturition, which proceeds more than 1 hour after laceration of the fetal membranes with recurrently requested assistance. Dystocia perhaps one of two maternal or fetal sources.

**Aims:** The object of this study is to recognize the types of dystocia, and their impact on the viability of goat fetus

**Materials and methods:** A total of 32 local breed goats (22 multipara, 10 primipara), aged between 1-3 years and weight 25-35 kg, suffering dystocia.

**Results:** The number of multiparous goats was 22 (68.75%), whilst primiparous goats was 10 (31.25%). The multiparous goats have difficult birth with anterior presentation of fetus were 16 (72.75%) and involved 12 (75%) have difficult male birth with anterior presentation, and 4 (25%) have difficult female birth with anterior presentation.

The number of multiparous goats have difficult male birth with posterior presentation of fetus was six (27.25%). Four dead fetuses or births have flexion of hock joints (66.66%), with significant difference toward dead fetus at  $P < (0.01)$ . Two dead fetuses had flexion of retained hind limbs (33.34%) without significant difference between dead and alive fetus in this type of dystocia.

The number of primiparous goats with difficult births with anterior presentation of fetus was 10 (31.25%). Primiparous goats with difficult male birth with anterior presentation of fetus were eight. Four dead fetuses resulted from ring-womb (50%), four dead fetuses have related oversize (50%) with significant difference between dead and alive fetuses among these types of dystocia at  $P < (0.01)$ . primiparous goats with difficult female birth with anterior presentation of fetus were 2 dead fetuses (100%) without significant difference between dead and alive fetuses in this type of dystocia.

**Conclusions:** It can be concluded that dystocia occurred in both multiparous and primiparous goats, and this dystocia due to fetal causes is more than dystocia due to maternal causes. Fetuses associated

with cases of dystocia due to fetal causes were dead, whereas more fetuses associated with cases of dystocia due to maternal causes were alive.

**Keywords:** Sorts of Dystocia, Fetal Viability, Caprine.



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## Introduction:

Dystocia or difficult labor, is identified as persistent and difficult parturition, which requires more than 1 hour after laceration of the fetal membranes (Hussein & Zaid, 2010; Anusha, et al., 2016; Zuhair, 2017; Mostefai, et al., 2019) with repeated assistance being essential (Singh, et al., 2017). (Mostefai, et al., 2019) also dystocia can be defined as difficulties in parturition go to the point of requiring human interference. Dystocia was regarded as soon as the dam had more than 1 hour of active labor without generating a newborn. It is a causative factor in perinatal death of dams and newborns due to destruction to the birth canal and usage of extreme pull forces (Purohit, 2006; Bhattacharyya, et al., 2015). Dystocia can be either of maternal or fetal sources (Singh, et al., 2017). Maternal dystocia occurred primarily due to a incomplete expansion of the cervical canal (ring womb), restricted pelvis and uterine inertia (Ali, 2011; Noakes, et al. 2009). Fetal dystocia happened primarily due to maldisposition, oversize, and emphysema of fetus (Jackson, 1995; Majeed & Taha, 1989a; Majeed & Taha, 1989b). The occurrence of dystocia is raised in goats compared to ewes (Mehta, et al., 2002; Elchikh, et al., 2020). The prevalence of dystocia differs between 8-50 % in both sheep and goats and looks to be more in dams carrying single and male fetuses (Purohit, 2006). Dystocia in goats, results in enormous economic losses to owners because of death of newborn or dam or negatively affecting dam fertility (Gupta, et al. 2020).

## Materials and Methods:

The study was carried out in Diyala province in period extends from 15/9/2024 until 15/2/2025 on the local breed goats presented in the veterinary clinics distributed throughout the Diyala province. A total 32 local goats are bred in farms and depending in their feeding on the green fodder and concentrated ration. The concerning data to these goats were obtained and included the nature of birth, sex of fetus (male, female), presentation of fetus (anterior, posterior), viability of fetus (dead, alive). After taking these data, these goats were allocated to :

First group included multiparous goats (22), and this group was categorizing into: -

- A- Difficult male birth goats with anterior presentation of fetus.
- B- Difficult female birth goats with anterior presentation of fetus.
- C- Difficult male birth goats with posterior presentation of fetus.

Second group included primiparous goats (10), and this group was categorizing into: -

- A- Difficult male birth goats with anterior presentation of fetus.
- B- Difficult female birth goats with anterior presentation of fetus.

### Statistical analysis

All outcomes were statistically analyzed utilizing Chi square ( $\chi^2$ ) to limit the significant variances between 2 groups (SAS, 2018).

### Results:

**Table 1:** This table explains the cases of dystocia in the multiparous goats, which are twelve cases. Ten cases associated with male dead fetuses and related to the fetal causes of dystocia whilst two cases, which are ring-womb, were accompanied with live ones and related to the maternal causes of dystocia.

Table 1: Number of difficult male labors together anterior presentation of fetus in multiparous goats.

Cases	Dead fetuses	Alive fetuses	P-value
Fetal head deviation into left side	2(16.66%)	0	NS 0.186
Fetal head deviation into right side	2(16.66%)	0	NS 0.186
Fetal head deviation upward to the dams sacrum	1(8.33%)	0	NS 0.647
Twin with four forelimbs of both fetuses	2(16.66%)	0	NS 0.186
Anterior presentation with fetal abdomen toward the dams sacrum	1(8.33%)	0	NS 0.647
Related oversized fetus	2(16.66%)	0	NS 0.186
Ring-womb	0	2(16.66%)	NS 0.186
NS: Non-significant			

Table (2) table explains four cases of female labor dystocia; all cases related to the maternal causes of dystocia. Two fetuses related with uterine inertia were dead and two fetuses related to ring-womb were alive.

Table 2: Number of difficult female labor together anterior presentation of fetus in multiparous goats.

Cases	Dead fetuses	Alive fetuses	P-value
Uterine inertia	0	2(50%)	NS 0.186
Ring-womb	2(50%)	0	NS 0.186
NS: Non-significant			

Table (3) table explains the cases of dystocia associated with posterior presentation of male fetus in the multiparous goats, the number of dead fetuses was four related to flexion of fetal hock joints, whilst two dead fetuses related to the flexion of retained fetal hind limbs.

Table 3: Number of difficult males labor together posterior presentation of fetus in multiparous goats.

Cases	Dead fetuses	Alive fetuses	P-value
Flexion of fetal hock joints	4(66.66%)	0	0.0088 **
Flexion of retained fetal hind limbs	2(34.34%)	0	NS 0.186
(P<0.01) **, NS: Non-significant			

**Table (4)** table explains the cases of dystocia related to male difficult labor together anterior presentation of fetus in the prim parous goats, which were eight. Four dead fetuses associated with related oversized fetus and four dead fetuses related to the ring-womb.

Table 4: Number of difficult male labor together anterior presentation of fetus in prim parous goats.

Cases	Dead fetuses	Alive fetuses	P-value
Related oversized fetus	4(50%)	0	0.0088 **
Ring-womb	4(50%)	0	0.0088 **
(P<0.01) **			

**Table 5:** This table explains the case of dystocia related with difficult female labor together anterior presentation in prim parous goats and related to maternal uterine inertia. The fetuses related to this type of dystocia were dead fetuses.

Table 5: Number of difficult female labor together anterior presentation in the prim parous goats.

Cases	Dead fetuses	Alive fetuses	P-value
Uterine inertia	2(100%)	0	NS 0.146
NS: Non-significant			

## Discussion:

The results shown in the table (1) revealed to the incidence of fetal reasons of dystocia, which are more than the maternal reasons of dystocia in the multiparous goats have male difficult births with anterior presentation. These results agreed with many researches indicated that fetal causes are most common as causes of dystocia compare with maternal causes (Elchikh, et al, 2020; Gupta, et al, 2020). The fetal causes in this table included left, right and upward fetal head deviation besides twin with four forelimbs of both fetuses, anterior presentation with fetal abdomen toward the dam's sacrum and oversized fetuses, while the maternal cause of dystocia was ring-womb. All the fetuses associated with these types of dystocia were dead. These findings are accord with several researches mentioned that the fetal mal presentation or disposition are the serious causes influence negatively on the survival of fetus (Yadav, et al, 2024; Camara, et al, 2012; Sharma, et al, 1999; Mansingh, 2016). It is well known that the male births in small ruminants (goats and sheep) or large ruminants (cows)

accompanied by dystocia (Jacobson, et al, 2020; McHugh, et al, 2016; Matheson, et al, 2012; Everett-Hincks & Dodds, 2008). (Horton, et al, 2018) and (Sobiraj, 1994) described that the occurrence of dystocia increased with dam age. The maternal cause of dystocia in this table was Ring-womb, which is unfinished cervical dilatation, and detected as the most current reason of dystocia in goats and sheep (Kumar, et al, 2013). Disability of the cervix to expand may linked to failure of hormonal secretion that dominance labor or of the tissue response to hormonal secretion (Wu, et al, 2004; Palliser, et al, 2006; Ali, 2011). The fetuses associated with this case were alive, and this result is in accord with many studies demonstrated that births associated with this case may be alive or dead fetuses (Kafi, et al, 2024).

The results demonstrated in the table (2) are in agreement with many studies revealed to the uterine inertia and ring-womb as maternal causes of dystocia related to the difficult female births with anterior presentation of fetus lead to incidence of dystocia (Zuhair, 2017; Singh, et al, 2017; Bhattacharyya, et al, 2015; Majeed & Taha, 1989b). The fetuses related to dystocia in account to the uterine inertia were alive and this may be due to the fact stated the female births have lighter weight and there is compatibility between the fetal size and size of maternal pelvic made the fetuses being viable, whereas the fetuses related to the ring-womb were dead and this potential is present in the cases of dystocia accompanied ring-womb (Kumar, et al, 2013; Kafi, et al, 2024).

The results in the table (3) are in accord with previous studies indicated to the occurrence of dystocia with the difficult male births with posterior presentation in multipara goats (Purohit, 2006; Bhattacharyya, et al, 2011). The types of dystocia associated with the posterior presentation included flexion of hock joints and flexion of retained hind limbs and the fetuses associated with these types of dystocia were dead and this revealed to the serious fetal mal-disposition cause of dystocia, which had apparent impact on the fetal viability (Noakes, et al, 2009; Jackson, 1995). The death of fetus associated with these types of dystocia may attribute to the prolonged birthing process besides to the fact that this fetal mal-disposition resulting in the occurrence of difficult birth (Kenyon, et al, 2019).

Table (4) revealed to the case of dystocia related to the difficult male labor together anterior presentation in primiparous goats. The fetuses associated with these types of dystocia were dead and these findings agreed with several studies mentioned that the death accompanied the fetuses associated with these types of dystocia (Zuhair, 2017; Purohit, 2006; Bhattacharyya, et al, 2015; Noakes, et al, 2009). The results showed in this table that fetal oversize was a cause of dystocia in primiparous goats, and many studies revealed that this case is rare in goats but may be presented (Ali, 2011; Jackson, 1995; Majeed & Taha, 1989b). It has been reported that the younger dams need a prolonged parturition and desire more birthing support than mature ones (Elchikh, et al, 2020; Majeed & Taha, 1989b). The relationship between younger age and difficult labor is often referred to the smaller, younger goats having a variance between the size of the goat and kid (Noakes, et al, 2009; Jackson, 1995). This will lead to the incompatibility between size of fetus and size of maternal pelvis (Majeed & Taha, 1989b; Gupta, et al, 2020).

Table (5) showed the case of dystocia which was uterine inertia and the female fetuses associated with this type of dystocia were dead and these outcomes are in agreement with several studies showed that the uterine inertia as a maternal cause of dystocia accompanied by dead or alive fetuses (Purohit, 2006; Bhattacharyya, et al, 2015; Ali, 2011; Jackson, 1995). Uterine inertia and specifically secondary uterine inertia are caused by the existence of maldisposed fetus and is more popular in goats and sheep (Ali, 2011; Jackson, 1995). Maldisposition of fetus would lead to the failure of expulsive forces of both uterus and abdomen, and thus occurrence of dystocia (Purohit, et al, 2004; Kumar, et al, 2013).

The results of our study in the five tables pointed out that the rate of fetal reasons of dystocia was higher than the maternal reasons of dystocia in goats. These findings are in accord with many previous studies (Hussain & Zaid, 2010; Zuhair, 2017; Elchikh, et al, 2020; Yadav, et al, 2024), and disagreed with others (Mostefai, et al, 2019; Singh, et.al, 2017). The sex of fetus plays a good role in incidence of dystocia in goat and sheep (Purohit, et al, 2004; Noakes, *et.al*, 2009; Purohit, 2006) due to the heavier birth-weight of males in compare to females which have lighter body weight (Bhattacharyya, et al, 2015; Elchikh, *et.al*, 2020).

How did dystocia influence the viability of fetus?

Regardless of the etiology of dystocia or difficult birth, the sequela of prolonged labor and dystocia are an augmented danger of asphyxia and circulatory compromise resulting in central nervous system lesions and edema (Jacobson, et.al, 2020). Hemorrhage of the central nervous system and blood vessel expansion may be artefactual and grossly lesions can occur in lack of neuronal degeneration or central nervous system necrosis (Sobiraj, 1994). The lesion's severity is associated with mortality danger (Jacobson, et.al, 2020).

### **Conclusions:**

Dystocia takes places in both multiparous and primiparous goats, and this dystocia in account to fetal causes is more incidence than dystocia due to maternal causes. Fetuses associated with dystocia due to fetal causes were dead, whereas more fetuses associated with cases of dystocia due to maternal causes were alive.

### **Recommendations:**

Conducting further studies included the goat's spreaded overall Iraqi provinces to recognize the rate of incidence and the types of dystocia, and to check out the relation between a season form year and occurrence of dystocia in this species.

### **Conflict of Interest:**

The authors declare no conflict of interest.

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#### **Authors Contributions:**

Both of authors contributed equally to the conception, design, data collection, analysis, and writing of the manuscript.

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