



*Original Research*

## Effect of Dietary Supplementation of *Shatavari* (*Asparagus racemosus*) Root Powder on Reproductive Performance of Large White Yorkshire Sow

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### Abstract

The present study was conducted to investigate the effect of *Asparagus racemosus* (*Shatavari*), supplementation during prepartum period on reproductive performance of Large White Yorkshire sows. A total of 18 sows of 1<sup>st</sup> to 4<sup>th</sup> parity were divided into 3 groups comprising 6 sows in each group namely T<sub>1</sub>, T<sub>2</sub> and control. Sows in control group were fed with basal diet while sows in T<sub>1</sub> and T<sub>2</sub> were subjected to *shatavari* supplementation @ 100 mg and 200 mg/kg body weight respectively from day 84 of gestation till day of farrowing. The result revealed that dietary supplementation of *Shatavari* root powder during 84 days of gestation had significantly ( $P < 0.05$ ) increased the number of live born piglets and litter weight at birth compared to the control group. It reduced the incidence of mummified fetuses. Moreover sows supplemented with *Shatavari* root powder had significantly ( $P < 0.05$ ) reduces the occurrence of dystocia, number of still born piglets and shorten the duration of farrowing. In conclusion the dietary supplementation of *Shatavari* root powder during prepartum period enhances the reproductive performance of Large White Yorkshire sows.

**Key words:** Feeding, Large White Yorkshire Sow, Pregnancy, Reproductive Performance, *Shatavari* Plant Root

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## Introduction

The role of livestock sector is very crucial in the economy of India. For majority of tribal population in the North Eastern Region of India, livestock keeping especially pig rearing is integral to their way of life, with 3.8 million pigs which is over one quarter of the total pig population of the country (Anon, 2012). It is one of the most important livestock which play an important role in improving the economic status of the tribal and weaker section of the society in the North East. In spite of several opportunities in pig based entrepreneur, the pig farmers' faces several challenges in pig farming. Higher rate of born dead and mummified foetus at birth, Mastitis-Metritis- Agalactia syndrome (MMA), low birth weight of piglets, poor milk yield, longer weaning to estrus interval are the major reproductive problems of the female pigs. Insufficient uterine space, inability of the sow to nourish the foetuses, hormonal imbalances, infections etc. causes born dead, mummified foetuses or low birth weight of piglets. MMA syndrome predisposes the young piglets to many infections and death. To counteract these problems, applications of antibiotics or hormonal preparations are the common practices in which the pig farmers or the veterinarian follows. Indiscriminate use of antibiotic and hormonal preparations may lead to problems associated with drug resistance and other reproductive disorders like cystic ovary, hypothyroidism, repeat breeding, loss of libido etc. Shatavari was reported to be the best female reproductive system tonic and toner (Brown, 1995) it helps in increasing blood glucose (Berhane, 2000) and oestrogen level (Mitra *et al.*, 1999; Pandey *et al.*, 2005). Improved level of blood glucose and oestrogen level increase the flow of glucose in uterine endometrium; consequently there is more glycogen synthesis (Pandey *et al.*, 2005). The energy source for the female reproductive system is oestrogen dependent glycogen. Oestrogen increases the glycogen content in the uterus as well as it helps in easy farrowing and reduces the incidences of still birth. However no such study was carried out in pigs. Keeping in view the present study was carried out to investigate the effects of dietary supplementation of *Shatavari (Asparagus racemosus)* root powder on reproductive performance of Large White Yorkshire Sow.

## Materials and Methods

The experiment was conducted on eighteen pure bred Large White Yorkshire sows (1<sup>st</sup> to 4<sup>th</sup> parity) which were further divided into three groups comprising six sows in each group namely- Treatment 1(T<sub>1</sub>), Treatment 2 (T<sub>2</sub>) and control in such a way that effect of parity and sire is nullified. All the experimental animals were fed standard gestation rations from day 84 to the day of farrowing (NRC, 1998) incorporating conventional feed ingredients. Feed containing dried powder of Shatavari (*Asparagus racemosus*) were fed to the gestating sow @100mg/kg body weight/day for the sow in T<sub>1</sub> group and @ 200mg/kg body weight/day for the sow in T<sub>2</sub> group, whereas the sows in the control group were fed standard gestation without addition of *Shatavari (Asparagus racemosus)*. All the sows were on restricted feeding, gestation

ration @ 2 kg/day/sow were fed from day 84 of gestation up to day of farrowing. Parameters such as litter size and litter weight at birth, number of still birth, number of mummified foetuses duration of farrowing and incidence of dystocia were studied. Data were analysed using IBM SPSS version 20. For group differences mean were compared using Tukey's multiple range test.

## Results and Discussion

The reproductive performance parameters viz. litter size and litter weight at birth, number of stillbirth, number of mummified foetuses and farrowing duration were analysed and the results are presented in Table 1.

**Table 1:** Effect of *Asparagus racemosus* supplementation on reproductive performance of Large White Yorkshire sow

Parameters	Groups			F- value
	T <sub>1</sub>	T <sub>2</sub>	Control	
Number of live piglets at birth	11.00 <sup>a</sup> ± 0.25	11.16 <sup>a</sup> ± 0.40	8.17 <sup>ab</sup> ± 0.16	33.37 <sup>**</sup>
Litter weight at birth (kg)	12.96 <sup>a</sup> ± 0.37	13.05 <sup>a</sup> ± 0.64	10.12 <sup>ab</sup> ± 0.19	14.06 <sup>**</sup>
Number of Mummified foetuses	0.83 ± 0.30	0.83 ± 0.30	1.16 ± 0.31	0.39 <sup>NS</sup>
Number of Still born piglets	1.33 <sup>a</sup> ± 0.49	1.16 <sup>a</sup> ± 0.30	2.66 <sup>ab</sup> ± 0.42	3.92 <sup>**</sup>
Duration of farrowing (min)	205.83 ± 21.89	203.17 ± 28.43	219.66 ± 7.15	0.174 <sup>NS</sup>
Incidence of dystocia, n=6 (%)	0	0	33.33 (2)	

\*\*Significant ( $P < 0.01$ ), <sup>NS</sup> Non significant; Figure in parentheses indicates number of animals; Means bearing same superscript in a row do not differs significantly

The data indicated that supplementation with *Shatavari* in sow diet had a significant ( $P < 0.05$ ) effect on reproductive performances of Large White Yorkshire sows. The dietary supplementation of *Shatavari* root powder during 84 days of gestation had significantly ( $P < 0.05$ ) increased the number of live born piglets and litter weight at birth compared to the control group. As recent reports have verified that *Shatavari* is a potent reproductive tonic and it thus cleanses, nourishes female reproductive system, removes infertility as it supports deeper tissue and builds blood to prepare the womb for conception, prevents miscarriage and acts as a post-partum tonic where it helps to increase lactation yield and faster involution of uterus. It also helps in balancing the reproductive hormonal level (Tirtha, 1998). The root of *Shatavari* works as a stimulant of endometrium and ovarian tissues, regulating menstruation and ovulation, balance hormonal level (TSH, estrogen, FSH, LH) and improved the conception rate (Kumar *et al.*, 2001).

In the present study, the incidence of mummified foetus was low as compared to control group. Moreover, sows supplemented with *Shatavari* root powder had significantly ( $P < 0.05$ ) reduces the occurrence of dystocia, number of still born piglets and shorten the duration of farrowing which might be due to phytosterols. The root of *shatavari* contains phytosterols (Visavadiya and Narasimhacharya, 2007) that helps in maintaining the blood glucose and estrogen level, enhanced level of blood glucose and estrogen. The increased flow of glucose in the uterine endometrium (Pandey *et al.*, 2005) might help in foetal growth.

Moreover phytosterols bind directly to the estrogen receptors without enhancing the endogenous estrogen levels (Gopumadhavan *et al.*, 2005). A higher concentration of estrogen may result in a faster rate of uterine involution due to increased PGF2 alpha release and vice versa (Pandey *et al.*, 2005).

### Conclusion

Ayurveda has been practiced in India since time immemorial with great success. Use of Shatavari is well documented in dairy animals; however no literatures are available on pig. With the growing concern about food safety demand of residue free meat is increasing day by day. In conclusion, the dietary inclusion of Shatavari (*Asparagus racemosus*) at the rate of 100mg and 200mg/ kg body weight of Large White Yorkshire sow had increased the number of live born piglets and litter weight at birth and reduces the occurrence of dystocia, number of still born piglets and shorten the duration of farrowing. As both the doses of 100mg and 200mg/ kg body of Large White Yorkshire sow did not find any differences, so the accurate dose will be depend upon the availability and cost of the root powder.

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