Evaluation of pig rearing farmers of North East India as prospective breeder: A retrospective analysis

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ABSTRACT

The present study was conducted for objective evaluation of the pig rearing farmers of north east India as breeder. Preliminary survey of persons engaged in pork production and processing were made, and reproductive tracts of slaughtered animals were collected from organized (ORG-) and unorganized (UNORG-) slaughter houses in and around Guwahati for assessing their reproductive status through morphometric examination and maturation potential of oocytes. The survey revealed that male pigs, sourced from organized farms, were mostly slaughtered at 8-12 months of age, whereas female pigs were slaughtered after third or fourth farrowing, at ORG-slaughter houses. Pigs slaughtered at UNORG-slaughter houses were mostly sourced from primary producers and household enterprises, and stage of reproductive life was not an important factor influencing the decision to selling. Organometry of female genital organs showed higher values (P<0.05) for pigs slaughtered in ORG-slaughter houses. Further, higher numbers (P<0.05) of corpus luteum were found in ORG-ovaries. However, higher number (P<0.05) of surface follicles, in-vitro matureable oocytes and in-vitro matured oocytes were found in UNORG-ovaries. The results of present study suggest that female pigs of unorganized production system are more likely to be sold and slaughtered before realizing their (re)production potential.

Key words: Farmer, In-vitro, Oocyte, Organized, Organometry, Pig, Slaughter house, Unorganized.

INTRODUCTION

Pig is one of the livestock species which is equally adapted to diversified as well as intensive agriculture. Although they contribute significantly towards ensuring nutritional and livelihood security of millions of resource-poor farmers of India, mainly tribal and marginal, their role in progressive agriculture has not been captured at appropriate scale. Presently, pig population of the country stands at 11.13 million (Livestock Census, 2007), registering a sharp decline of 17.64% as compared to population census of 2003. Interestingly, north eastern part of the country hosts 40.04% of total pig population, and registered an increase of 16.82% for the corresponding period. The problem is compounded by limited geographical distribution with market demand and low genetic base. One of the major factors limiting the progress of this sector is non-availability of sufficient breeding animals. Reach of government and institutional pig breeding farms has been found to be limited, with practically absence of private breeding organizations and breeder farmers. Sectoral analysis reveals that the shortfall in supply of breeding stock needs to be addressed on priority basis to realize the potential. In the following study, a retrospective analysis is presented with respect to representative pig rearing farmers to judge their merit towards being a prospective breeder.

MATERIALS AND METHODS

Survey was conducted involving personnel engaged in organized (ORG-) as well as unorganized (UNORG-) slaughter houses (who happened to be primary or secondary producer) in and around Guwahati, capital city of Assam. Information regarding average holding size, age of selling/slaughter of pigs, reason behind the decision to sell/slaughter was collected. For assessment of reproductive status during the stage of slaughter of female pigs, genital tracts were collected. Organometry of female genital organs showed higher values (P<0.05) for pigs slaughtered in ORG-slaughter houses. Further, higher numbers (P<0.05) of corpus luteum were found in ORG-ovaries. However, higher number (P<0.05) of surface follicles, in-vitro matureable oocytes and in-vitro matured oocytes were found in UNORG-ovaries. The results of present study suggest that female pigs of unorganized production system are more likely to be sold and slaughtered before realizing their (re)production potential.
RESULTS AND DISCUSSION

Survey of slaughter house personnel revealed that pigs raised in unorganized production systems and household enterprises were mostly slaughtered at UNORG-slaughter houses, whereas those raised in organized production systems, like institutional and private farms, were mostly slaughtered at ORG-slaughter houses. Average holding size of unorganized production systems and household enterprises was found to be lower (2-3 pigs). Surplus male pigs of organized production systems were mostly slaughtered at 8-12 months of age, and female pigs were slaughtered after third or fourth farrowing when the litter size was reported to be markedly reduced. It was revealed that stage of reproductive life of animal did not influence the decision to sell or slaughter in unorganized production system.

Organometric data of female genital organ of slaughtered pigs collected from ORG- and UNORG-slaughter houses are presented in Table 1. The measured length and width of ovary, and length of oviduct, uterine horn, body of uterus, cervix and vagina, sourced from ORG-slaughter houses, were found to be higher (P<0.05) than those sourced from UNORG-slaughter houses. The observed values for genital tracts (Dyck and Swierstra, 1983; Bartol et al., 1993) sourced from UNORG-slaughter houses indicate that female pigs raised on unorganized production systems may even be slaughtered at prepubertal stage. On the other hand, observed higher values for genital tracts (Dyck and Swierstra, 1983; Bartol et al., 1993) sourced from ORG-slaughter houses indirectly confirms the observation made through survey that female pigs raised on organized production system are mostly slaughtered after third or fourth farrowing. Further, ovaries collected from ORG-slaughter houses showed presence of higher number of corpus luteum (CL) (right ovary: 10.25±0.38 and left ovary: 10.82±0.49) compared to nil or a maximum of 3 CL on ovaries collected from UNORG-slaughter houses. This further supports the observations made through organometric study.

Higher number (P<0.05) of surface follicles were observed on ovaries sourced from UNORG-slaughter houses compared to ORG-slaughter houses (Table 2). The average number of surface follicles presented on the right and left ovaries sourced from ORG-slaughter houses were 2.75±0.21 and 2.5±0.38 respectively, and the corresponding values for UNORG-slaughter houses were 12.75±0.38 and 15.0±0.79, respectively. The relatively lower number of surface follicles present on the ovaries sourced from ORG-slaughter houses might be due to aging of the gilts (Peluso et al., 1979), further indicative of the fact that the animals might have already undergone third or fourth farrowing. The recorded higher numbers of surface follicles present on the ovaries sourced from UNORG-slaughter houses confirms the observations made through studies of organometric data and number of CL. Recovery of oocytes following slicing and aspiration was also higher (P<0.05) in ovaries sourced from UNORG-

<table>
<thead>
<tr>
<th>Source (slaughter house)</th>
<th>Ovary</th>
<th>Oviduct (cm)</th>
<th>Uterine horn (cm)</th>
<th>Body of uterus (cm)</th>
<th>Cervix (cm)</th>
<th>Vagina (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Length (cm)</td>
<td>Width (cm)</td>
<td>Length</td>
<td>Left</td>
<td>Right</td>
<td>Left</td>
</tr>
<tr>
<td>UNORG- (n=8)</td>
<td>2.60±0.24</td>
<td>2.60±0.24</td>
<td>1.5±0.12</td>
<td>1.63±0.14</td>
<td>17.12±1.79</td>
<td>16.98±1.62</td>
</tr>
<tr>
<td>ORG- (n=8)</td>
<td>3.42±0.10</td>
<td>3.20±0.10</td>
<td>2.34±0.14</td>
<td>2.43±0.09</td>
<td>18.69±0.64</td>
<td>19.64±1.02</td>
</tr>
</tbody>
</table>

Means with different superscript within a column differ significantly (P<0.05)
TABLE 2: *In-vitro* maturation of oocytes recovered from surface follicles of ovaries

<table>
<thead>
<tr>
<th>Source (slaughter house)</th>
<th>Surface follicle</th>
<th>Recovery of oocyte</th>
<th>Matureable oocyte recovered</th>
<th><em>In-vitro</em> matured oocyte</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Slicing</td>
<td>Aspiration</td>
<td>Slicing</td>
</tr>
<tr>
<td>UNORG- (n=16)</td>
<td></td>
<td>13.88(^a) ± 0.48</td>
<td>25.5(^a) ± 1.10</td>
<td>22.00(^a) ± 0.98</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25.5(^a) ± 1.12</td>
<td>21.25(^a) ± 1.02</td>
<td>17.0(^a) ± 1.03</td>
</tr>
<tr>
<td>ORG- (n=16)</td>
<td></td>
<td>2.63(^b) ± 0.22</td>
<td>5.5(^b) ± 0.53</td>
<td>4.75(^b) ± 0.51</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.5(^b) ± 0.47</td>
<td>3.06(^b) ± 0.40</td>
<td>2.19(^b) ± 0.31</td>
</tr>
</tbody>
</table>

Means with different superscript within a column differ significantly (P<0.05)

slaughter houses compared to ORG (Table 2). The same trend was also found with respect to number of maturable oocytes (P<0.05) (Fig. 1; Table 2). Observed lower recovery rate of total oocytes and matureable oocytes from the ovaries sourced from ORG-slaughter houses might be attributed to differences in age and health of the female as has been observed in buffalo by Mahmoud, 2001. Evaluation of *in-vitro* maturation of oocytes on the basis of cumulus expansion (Gabriel *et al*., 2009) revealed higher number (P<0.05) of matured oocytes (Fig. 2) from the ovaries sourced from UNORG-slaughter houses compared to ORG (Table 2).

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