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Cultural and Economic Motivation of Pig Raising Practices in Bangladesh

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Abstract

The interactions that pig raisers in Bangladesh have with their pigs could increase the risk of zoonotic disease transmission. Since raising pigs is a cultural taboo to Muslims, we aimed at understanding the motivation for raising pigs and resulting practices that could pose the risk of transmitting disease from pigs to humans in Bangladesh, a predominantly Muslim country. These understandings could help identify acceptable strategies to reduce the risk of disease transmission from pigs to people. To achieve this objective, we conducted 34 in-depth interviews among pig herders and backyard pig raisers in eight districts of Bangladesh. Informants explained that pig raising is an old tradition, embedded in cultural and religious beliefs and practices, the primary livelihood of pig herders, and a supplemental income of backyard pig raisers. To secure additional income, pig raisers sell feces, liver, bile, and other pig parts often used as traditional medicine. Pig raisers have limited economic ability to change the current practices that may put them at risk of exposure to diseases from their pigs. An intervention that improves their financial situation and reduces the risk of zoonotic disease may be of interest to pig raisers.

Keywords

pig raising; zoonoses; culture; economy; Bangladesh; intervention

Introduction

Pigs are raised in the South-Asia, including India, Nepal, Bhutan, and Bangladesh (Gatenby and Chemjong 1992; Dukpa et al. 2011; Prasad et al. 2011; Nahar et al. 2012). In India, low caste Hindus, who have low status in the social hierarchy, raise pigs, and consume pork (Stevenson 1954). They slaughter pigs and serve pork as feast during traditional celebration (Dhagamwar 2003).

Although pigs are domesticated and pork is eaten all over the word, pigs are hosts for diseases that can be transmitted to people and contribute to emerging pathogens that can cause fatal disease outbreaks in humans and animals (Chua et al. 1999; Solomon et al. 2000;

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Van Reeth 2007; Steyer et al. 2008; Pavio et al. 2010). Humans are the primary host and pigs are the intermediate host of *Taenia solium*, a parasite that can cause disease on both humans and pigs (Sciutto et al. 2000). Consumption of improperly cooked pork can cause trichinellosis (Sethi et al. 2012). The introduction of the H1N1 virus to pigs provided the opportunity for a reassortment that became pandemic in humans in 2009 (Vijaykrishna et al. 2010). Contact with sick pigs in Malaysia led to Nipah virus infections in humans (Goh et al. 2000; Parashar et al. 2000; Chua 2003).

Existing pig raising practices in Bangladesh may pose a risk of exposure to zoonoses (Nahar et al. 2012; Nahar et al. 2013) because humans live very close to their pigs and often touch, caress, and feed them, exposing themselves to their saliva and feces (Nahar et al. 2013). In Bangladesh *Japanese encephalitis* is endemic in pigs (Khan et al. 2014). *J. encephalitis* virus can be transmitted from pigs to humans through mosquitoes (Solomon 2006; Erlanger et al. 2009). Although there are estimates of the incidence of *J. encephalitis* in humans (Hossain et al. 2010; Paul et al. 2011), knowledge about disease transmission from pigs to humans in Bangladesh remains limited. Pig raisers in Bangladesh are unaware that disease can transmit from pigs to humans and frequently come in close contact with sick pigs, sometimes even slaughter and consume the sick pig, increasing the risk of pig-to-human transmission (Nahar et al. 2012). Pig raisers live in poverty and pig raising is an offensive practice to the Muslim majority in Bangladesh. As a result, pig raisers experience stigmatization, discrimination and social rejection (Nahar et al. 2013).

Although public health interventions can help design strategies to prevent disease emergence, interventions to reduce the risk of pig-related diseases can also negatively affect the social and economic situation of already stigmatized pig raisers in predominately Muslim countries (Padmawatia and Nichter 2008; Audi 2009). This occurred in Egypt when in response to the influenza A (H1N1) pandemic, initially termed “swine flu”, Egyptian authorities culled 400,000 pigs as a preventive measure, although many local and international health organizations argued that pigs were not the source of illness (Audi 2009). This initiative undermined the livelihood of pig raisers and created political and ethnic tensions between minority Christian pig owners and the Muslim majority (Audi 2009).

We aimed at understanding cultural and economic motivations and the perspective of pig raisers for raising pigs, resulting in practices that could pose risk to transmit disease from pigs to humans in Bangladesh.

Methods

Since data on pig raisers were not available during the time we planned to conduct this study, we talked to sweepers from Dhaka municipality who were known to raise pigs and consume pork. Based on the information provided by them, we visited two backyard field sites in an urban municipality and a sub-urban area from two districts where all the pig raisers were Hindu. We selected these two areas for our study. Sweepers from Dhaka municipality also suggested that we visit a weekly pig market in Mymensingh District, to get in touch with the herders who moved their herds from place to place, foraging for food. We

visited the pig market and met several herders who came to sell their pigs on that day. We developed rapport and accompanied one of the herders to visit his herds, and he introduced us to other herders. Those herders later introduced us to other herders from other districts. Using this approach, we interviewed herders who took care of six herds from rural areas of six districts. All of them were Hindus. While visiting the pig market, we met costumers who came to buy pigs from the neighboring rural areas. They were from the matrilineal Mandi community, mostly Christians who raised pigs in their backyards. We developed rapport with one of the customers and included her village in our sample.

The field team consisted of five qualitative researchers including three authors (N.N., M.U. and R.S.). We collected data from August 2007 to September 2008. We selected informants who directly cared for pigs and conducted 17 in-depth interviews with backyard pig raisers and 17 in-depth interviews with herders (3 owners and 14 employees) to explore their perspective and cultural and economic motivation for raising pigs. The team also explored practices of slaughtering of pigs, consumption of pork, and use of pig products.

The field team recorded interviews in Bengali and transcribed them verbatim. Two authors (N.N. and M.U.) reviewed and coded the data, identified emerging themes, grouped related coded data, and summarized findings.

Ethical Consideration

We obtained informed consent before conducting interviews. icddr,b's Ethical Review Committee approved this study.

Findings

Pig Raisers' Profile

Most of the pig raisers we interviewed were 'low caste' Hindus. Traditionally, the caste system determines social stratification among Hindus and a person's profession and social status that is unchangeable according to Hindu custom. Hindu informants indicated that pig raisers only married within their own caste, increasing the likelihood of a person from a family that raises pigs marrying another person from another pig raising family. The backyard pig raisers we interviewed raised pigs primarily in their household compounds. Both male and female household pig raisers participated. Participating herders were all male. Herd owners recruited employees from their own caste, preferably their close kin whom they could trust to take care of their pigs. Herders raised more pigs at a time than backyard owners.

Social and Business Network of the Pig Raisers

According to study informants, there are four groups of people involved in the sale and marketing of pigs: herd owners, backyard pig raisers, pig traders, and pork shop owners (Fig. 1). Per our Hindu informants, intra-marriage within the caste strengthened the social and business network of pig raisers.

Herd owners reported that they sold pigs to pork shop owners from their areas and from large cities. They also sold to pig traders, backyard raisers, and other herd owners. Pigs were often sold directly from their herds or at weekly pig markets where herders gathered to sell and buy pigs. According to the pig raisers, traders played a substantial role in pig marketing. They bought piglets from herders and sold pigs to backyard raisers, pork shop owners, and other herders. They also bought adult pigs from backyard pig raisers and sold them to pork shop owners. The main customers of pork shops were low caste Hindus, Christians, and indigenous communities were the main customers of pork shops. These indigenous communities are native, small ethnic groups that have lived in various areas across Bangladesh for generations. They have their own language and many of these groups live in the hilly eastern regions. Backyard pig raisers preferred to sell directly to people in their communities because they earned more through direct sales (US$ 1.5–2 per kg) than by selling to traders. Informants indicated that pig raisers, traders, and representatives from pork shops participated in a yearly pig fair to sell and buy pigs, strengthening their social and economic networks.

Rationale for Raising Pigs

Informants indicated cultural and economic reasons for raising pigs, despite obstacles to pig rearing in a Muslim country.

Cultural Motivation—Many cultural motivators made pig raising important, including myths, destiny, religion, beliefs, and customs, honor and pride.

Myth Behind Destiny: The herders we interviewed were called *Tarini Dash*, referring to their boatman profession origin. The traditional work of this caste was believed to be transporting people across rivers, symbolically taking the soul of the dead to eternity. They described the decline of the boatman profession as a curse from God because they refused to take God in their boat without a payment. They also talked about Harishachandra, a mythical character, a king who lost his kingdom and raised pigs. One day, when the *Tarini Dash* were waiting with their boats at the riverbank, Harishchandra asked them to look after his pigs for a while, promising he would be back soon. The boatmen looked after the pigs but Harishchandra never returned. The pig raisers we interviewed glorified their work through this story, as they felt proud of doing the same work as King Harishachadra.

An Ancient Custom, a Glorious Profession: All informants reported that their ancestors raised pigs. They learned how to raise pigs during childhood by observing and assisting older family members. They considered raising pigs a responsibility in memory of and out of pride for their ancestors.

Religion, Belief, and Customs: All Hindu informants referred to pigs as deities. They considered pigs to be sacred animals to be raised and worshiped. According to pig raisers, in the Hindu religion, slaughtering pigs is considered the best offering to satisfy God while performing religious rituals (*puja*). Slaughtering is also believed to help prevent future unwanted events, such as sickness and death of family members or livestock. All informants (both Hindu and Christians) reported that slaughtering a pig during weddings, births, and

funerals was a tradition. To Hindu informants, slaughtering in ceremonies also satisfied deities that could otherwise bring misfortune. All informants said that serving pork at ceremonial feasts brought honor and increased the social prestige of the host in the community. One pig raiser said, “We are Hindu. We do not eat beef. We slaughter pigs for our social and religious occasions.” Informants mentioned that it was difficult to afford buying pigs for such occasions, thus owning pigs made these sacrifices financially easier.

Economic Rationale

Secure Livelihood and Hope for a Better Future: For herd owners and their employees, raising pigs was their sole source of income. The yearly income of a herd owner varied according to the size of the herd, pig mortality and the loan amount borrowed from local creditors to run the herd. The following statement explains the economic situation of a herd owner;

> Suppose I have 10 female pigs. Within six months they can give birth to 50 piglets and 20 piglets might survive. Within six months, I can sell each piglet for 3000 taka (US$43; for a total 60,000 taka (US$ 860 (43$ ×20)). Since pigs give birth twice a year, it would be about 120,000 taka (US$1720) per year. If I have yearly herd expenses of 50,000 taka (US$ 725), including employees’ salary and food, the difference is for my household expenses and savings.

The quotation also indicates high mortality of piglets, which pig raisers explained was usually caused by either by disease or crushing of the newborns by other pigs.

Loans that other farmers secure for poultry, cattle, or fisheries were not available for pig raising from government or non-government organizations. So, herd owners often took large private loans from local creditors which took several years to repay. A catastrophic disease outbreak in the pig herd could be financially devastating. Owning a herd, however, was considered a sign of wealth that allowed the owner to hire employees and retire from working as a herder.

Herders reported that they typically assigned an experienced herder as the manager to lead and supervise employees. Managers generally knew where to find adequate food for the pigs. The herd owner visited the herd once or twice a month to check the herd and pay employees for living expenses. In our sample, a herd employee earned US$ 17–36 monthly as a salary and was paid an additional US$ 0.6 daily for food and other expenses. All herd employees expressed their desire to be herd owners. At the end of the year, employees had the option to take their salary in the form of piglets (preferably female) to start their own herd. However, they found it difficult to accept payment in piglets because their families relied upon their salaries for household expenditures. Thus, they rarely requested piglets as payment.

Household Needs: Backyard pig raisers raised pigs to supplement their primary income (US $ 36–58 per month) as laborers. They typically bought one to three piglets for about US$ 6–7 from herders when the piglet was less than 2 months old. If they raised the piglet for one to two years, they could slaughter or sell the pig for US$ 203–217. They said that their

families could not afford to buy an adult pig and it was much cheaper to buy piglets at a low price and raise them.

All informants considered pigs an asset, and some considered owning pigs as having a ‘savings account’, which they could access during financial emergencies. Sometimes they sold pigs to meet essential household needs, such as a child’s education, wedding and dowry expenses, repaying loans, or for house repairs. A backyard pig raiser explained the economic value of raising pigs:

> We are poor and we don’t have cash handy. We often don’t have anything at home to sell in an emergency or to meet our financial needs. If I have a pig or poultry, then I can sell it and meet urgent needs.

More Profitable Than Cattle Raising: Informants said that it was easier, cheaper, less labor intensive, and more profitable to raise pigs compared to cattle. It was more expensive to buy and feed a calf than a piglet. In addition, a cow gives birth to one calf a year, while a pig delivers several piglets per litter, twice a year. Compared to a calf, a piglet grows very fast and can be sold sooner for profit. A backyard pig raiser and a herder explained the benefits of raising pigs:

> It is not possible for us to manage grass for cattle because we live in a municipal area and there is no open field around us. Moreover, cattle need more space. We can put several pigs in a small place like a pigpen because they like to stay together. They eat, defecate, urinate and stay there. We do not need to spend much time or money on pigs. [A backyard pig raiser]

Traditional Medicine, Other Uses and Related Risk Behavior

All informants said that the entire body of a pig, including hair, teeth, bile and some materials related to pig raising such as mud from the pigsty or the herding stick, could be used or sold, and this contributed to their household income (Table 1). Major uses for these products were medicinal to treat both humans and animals. For example, informants reported that they applied pig feces to cure ringworm infections and skin diseases, and foot and mouth disease among cattle and pigs. Herders said that they first burned the pig feces and mixed it with coconut oil and then applied it. Some informants reported swallowing raw pig bile to treat their gastric reflux and night blindness. They also believed that freshly cooked pig liver could cure chronic diarrhea. Sometimes, they applied a drop of pig urine or milk in the ear of a child to treat an ear infection. Some of these pig products were frequently used for magical and material purposes (Table 1). The following statement is from a backyard pig raiser:

> We use pigs for many purposes. Sometimes, people come to buy mud from the pigpen to use as medicine. If anyone swallows raw bile, gastric problems will be cured forever. Massaging with pig fat oil can cure any pain, especially arthritis. The older the oil, the better it works. Some people come to take pig feces to make amulets. If anybody wears the teeth as a pendent, evil spirits would not dare to come nearby. Pig hair is used to make brushes for cleaning shoes.

Informants mentioned that Muslim *kobiraj* (traditional healers) often visited them to buy pig products such as pig feces and mud from pigsties, teeth, pig hair and male pig genitals to make medicines and amulets to treat both human and animal health problems and to prevent or perform black magic. Informants also reported that pig tongues and male genitals were sold to Hindu religious people who performed rituals to gain spiritual power. However, our informant could not say how those materials were exactly used to treat people or to perform rituals. Informants bargained with the buyers and usually earned from US$ 0.7–4.00 per item. The team observed that Muslims in the study areas occasionally asked for a piece of the pig stick when pig herds passed. The team also observed a Muslim woman wade into a pond with a piglet. The woman and pig raisers confirmed that this was a ritual believed to treat infertility.

Pig Slaughtering and Consumption Practices

All informants described household pork consumption as another reason to raise pigs. They said that they often slaughtered pigs in their backyard. Typically, 6 to 8 males were involved in slaughtering a pig and preparing the meat for their own consumption and selling within the community.

Raisers considered pigs ready to consume when the pig weighted about 100 kg. To slaughter the pig, they first tied pig's legs, tightly bound the pig and stabbed the pig's chest to kill it. Sometimes, the wounded pig escaped and ran around shedding blood. When the pig was dead, they washed the body with water, lightly scorched or scalded the carcass, and then scraped it with a knife to remove the skin and finally cut the pig into pieces.

The Hindu informants reported that if they killed a pig for a religious offering, they severed the head and collected the raw blood in a pot. As a ritual, the priest drank some of that raw blood with liquor to show respect to the deity and the rest was cooked with the meat. Hindu and Christian backyard pig raisers said that they would lightly roast the pig liver and brain just after butchering the pig and gave it to the children to eat. Some informants mentioned that they occasionally ate the thick layer of skin uncooked, sliced in small pieces, mixed with onion, salt, and chili. When a pig was sacrificed for religious purposes, only men were allowed to consume the head because of their higher position in society.

All the body parts were used for consumption or other purposes (Table 1); the pig raisers reported discarding only the hoof, nostril, ears and feces from the intestine in open places next to their houses, in ditches surrounding their houses, or in the river, where pigs scavenged.

Discussion

In this study, we found that pig raising was strongly tied to cultural beliefs and practices and financially important for both herders and backyard pig raisers. Similar to India, pigs are raised by low caste Hindus and used in traditional celebration in Bangladesh. Some of their practices and behavior related to culture and economy such as consuming the partially cooked raw skin layer or liver or brain, discarding body parts and feces in open places, consuming raw bile or other body parts as a medicine or other purposes might increase the

risk of infection spillover from pigs to humans. In Bangladesh, we still know very little about the risk of disease transmission from pigs to people, however, the contacts between pigs and humans that we identified in our study, would likely put humans at risk of disease transmission from infected pigs. Thus, it is important for public health experts to understand the cultural and economic rationale of pig raisers and its contribution to their communities to avoid strategies that could undermine community health by disregarding the well being of pig raisers (Audi 2009).

Pig raisers reported slaughtering pigs and preparing meat in their backyards. They often slaughter sick pigs to consume and to sell meats within the community when they believe that the pig might die due to the illness (Nahar et al. 2012). Although the field team did not observe these practices, the pig slaughtering process is likely similar to slaughtering and preparing other sick animals by Bangladeshi villagers that expose humans to pathogens and pose risk to humans for disease transmission (Chakraborty et al. 2012; Islam et al. 2013; Rimi et al. 2014).

Our informants reported consuming some uncooked or partially cooked pork that can pose risk of *T. solium* taeniasis (Sarti et al. 1994) and hepatitis E transmission to humans (Li et al. 2005). Our findings illustrate that people use different pig products for different purposes such as consuming raw products as a medicine, which might facilitate infectious disease transmission to humans. Examining the use and content of these products or epidemiological studies to look for potential exposure and risk factors for diseases transmission might help identify if those exposures pose risks to humans and domestic animals and so should be a focus of future interventions.

Raising pigs represents the primary livelihood for herders and a secure supplemental income to meet essential household needs of backyard raisers. However, pig raisers are poor enough that they may not be able to afford better hygiene and sanitation (Nahar et al. 2013). Because of their perceptions about what is ‘dirty’, they may not be aware about hygiene. Moreover, their circumstances often prevent good hygiene. For example, they do not consider pigs as dirty and so are not inclined to wash their hands after touching pigs or when a herder looks clean, it increased the possibilities of being robbed or beaten for money (Nahar et al. 2013). Pig raisers reported that they discarded pig body parts and feces from the intestine of the slaughtered pig in open places next to their houses where other pigs scavenged, which might make the surrounding environment prone to disease transmission to humans and their pigs.

To develop successful interventions, it is critical to understand the audience’s perspective to identify which behaviors to target and how to change them (Aboud and Singla 2012). Since pig raising practices are embedded in their social, cultural and economic spheres, it is difficult to change the behavior by simply telling pig raisers what to do to reduce the risk of disease transmission to humans. Indeed, a health education intervention study to reduce the incidence rate of porcine cysticercosis in a low income setting in Tanzania found that although the knowledge about transmission and prevention on porcine cysticercosis improved, people’s practices hardly changed after the intervention (Ngowi et al. 2008). This

lack of reduction in risky practices might result from the economic incentives and cultural beliefs that underlie preintervention practices.

Health interventions to change behavior have been more successful when they have aligned with the financial incentives of the target population (Morris et al. 2004; Herman et al. 2006; Doran et al. 2008; Lagarde et al. 2007). Reducing piglet mortality could be financial incentive to pig raisers since, in our study, they reported very high mortality rates among piglets. Piglets can die during the rainy season from exposure to the rain that makes some piglets sick and weak to compete with siblings for breast milk (Nahar et al. 2012). They can also die from being crushed by larger pigs in backyards and herds, as pigs live in small spaces and often do not have any separate shelters or areas for the newborns. Implementing an intervention similar to the one in Philippines targeting smallholder pig raisers could be an option (Taveros and More 2001). It noticeably decreased pig mortality by introducing heated piglet-separation pens, iron and B-complex vitamin injections, creep feeding, and early weaning (Taveros and More 2001). The investments in this intervention were cost-effective. A similar intervention might be too expensive for poor pig raisers to start with, but, promoting simple and low-cost changes to pig husbandry practices in Bangladesh, such as providing a warm, separate shelter for birthing and piglets, in addition to routine deworming, could reduce morbidity and mortality and improve their health (Holyoake et al. 1995; Andersen et al. 2009; Roepstorff et al. 2011; Kirkden et al. 2013). These simple changes could improve the income of pig raisers. Healthy pigs are more likely to have strong immune systems and are less likely to become infected or transmit diseases (Beck et al. 2004; Taylor et al. 2013). Effective promotion of good husbandry practices may be a cost-effective approach to not only improve raiser's income and community nutrition, but also to reduce population risk for zoonotic diseases. The existing social networks of the pig raisers could be used to promote such intervention.

Our study has limitations. We explored the motivation of pig raisers through in-depth interviews. Informants' self report of their motivations is often inaccurate (Sen 1977; Bernard et al. 1984) and so the impact of these reported motivations on actual behavior would be best confirmed by future pilot intervention assessments. We did not link the behaviors discussed with specific diseases, though future work in this area could help to prioritize interventions to reduce the highest risk behaviors. We also did not collect data on human illness associated with pig or piglet mortality. Considering certain behavior such as consumption of raw or partially cooked pork or the medicinal uses of pig products, this exploration might be useful to identify diseases most commonly transmitted from pigs to humans. We did not observe the pig slaughtering and preparation processes. Thus, we do not know how slaughtering practices, such as preparing meat, hand washing behavior, and discarding the body parts might create opportunities for disease transmission. Identifying the risk behavior related to slaughtering can help define strategies to prevent exposure to disease transmission.

Pig raising has major cultural and economic implications to a minority community with minimal economic ability to change their practices or shift their focus into other income generating activities. Since their practices and behavior might be associated with disease transmission, a good pig husbandry intervention under the One Health approach that

emphasizes the health benefits to both pigs and people could help reduce the risk of zoonotic disease.

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Appendix

Guidelines for In-Depth Interview with Pig Farmers (for Home Raising Pigs)

1. Tell me about your daily routine. (Get the description of his/her work on a usual day such as preparing food, times for taking food, drinking water source and also explore the work she/he does with pig)
2. Can you provide details about your pigs farming? (Number of pigs the person has, ways of pig rearing, types of food and care provided by the person, cleaning the pig and disposal of pig excrement, involvement of other family member, source of getting pigs, place to sell pigs, economic benefits, and transportation of pigs.)
3. Why do you raise pigs? (Make comparison with other domestic animals like cow and goats).
4. What are the common illnesses that pigs most suffer from? What do you do when a pig is sick? How do you take care of a sick pig during that period?(Home remedies and outside care. Try to explore the physical contact between pigs and farmers during the illness episode)
5. How do you prepare pork? (Explore the issues on slaughtering, processing, disposal of entrails and other uneaten parts, cooking and cleaning up)
6. Explore the use of pigs (Meat, medicinal use, use in rituals, economic purposes)
7. Explore the beliefs related to pigs such as sacrificing or ceremonial use.
8. Explore any NGO involvement in pig farming.
9. Explore some issues related to hygiene such as use of soap, washing hands, source of water.
10. What are the obstacles and barriers to being a pig farmer?

Guidelines for In-Depth Interview with Pig Herders

1. Tell me about your daily routine. (Get the description of his/her work on a usual day such as preparing food, times for taking food, collecting drinking water, sleeping arrangement, using mosquito net, assigned duties related to pig raising)
2. How does a pig herd work? (Explore the structure of a pig herd such as the number of people employed, division of labor, monthly wage, frequency of visiting family,

coping strategies with seasonal calamities, choosing a place to live or reasons behind leaving a place)

3. Can you provide details about your pig farming? (Explore the number of pigs and piglets in the herd, ways of rearing pigs, food and care provided to pigs and piglets, ways of taking care of sick pigs, pig marketing, economic benefit, transportation of pigs)
4. Explore the reasons behind selecting a place for the pig herd, duration of living in a place, contact with vegetables and crops and water. Seasonal influence related to choosing a place can be explore here.
5. Why do you raise pigs? (Make a comparison with other domestic animals like cows and goats). If the person does not own the pigs but is employed by a pig herd owner then explore the reasons behind choosing this occupation.
6. What are the common illnesses among pigs? What do you do when a pig is ill? How do you take care of pigs during that time? (Home remedies and outside care. Try to explore the physical contract between pigs and farmers during the illness episode)
7. Do you slaughter pigs from the pig herd? (Explore the issues on slaughtering, processing, disposal of entrails and other uneaten parts, cooking and cleaning up)
8. Explore any NGO involvement in pig farming.
9. Explore the use of pig (meat, medicinal use, use in rituals such as performing magic and economic use.)
10. Explore the beliefs related to pigs, such as sacrificing pigs, use of pigs in certain ceremonial occasions and others.
11. Explore some issues related to hygiene such as using soap, washing hands, source of water supply.
12. What are the obstacles and barriers to being a pig farmer?

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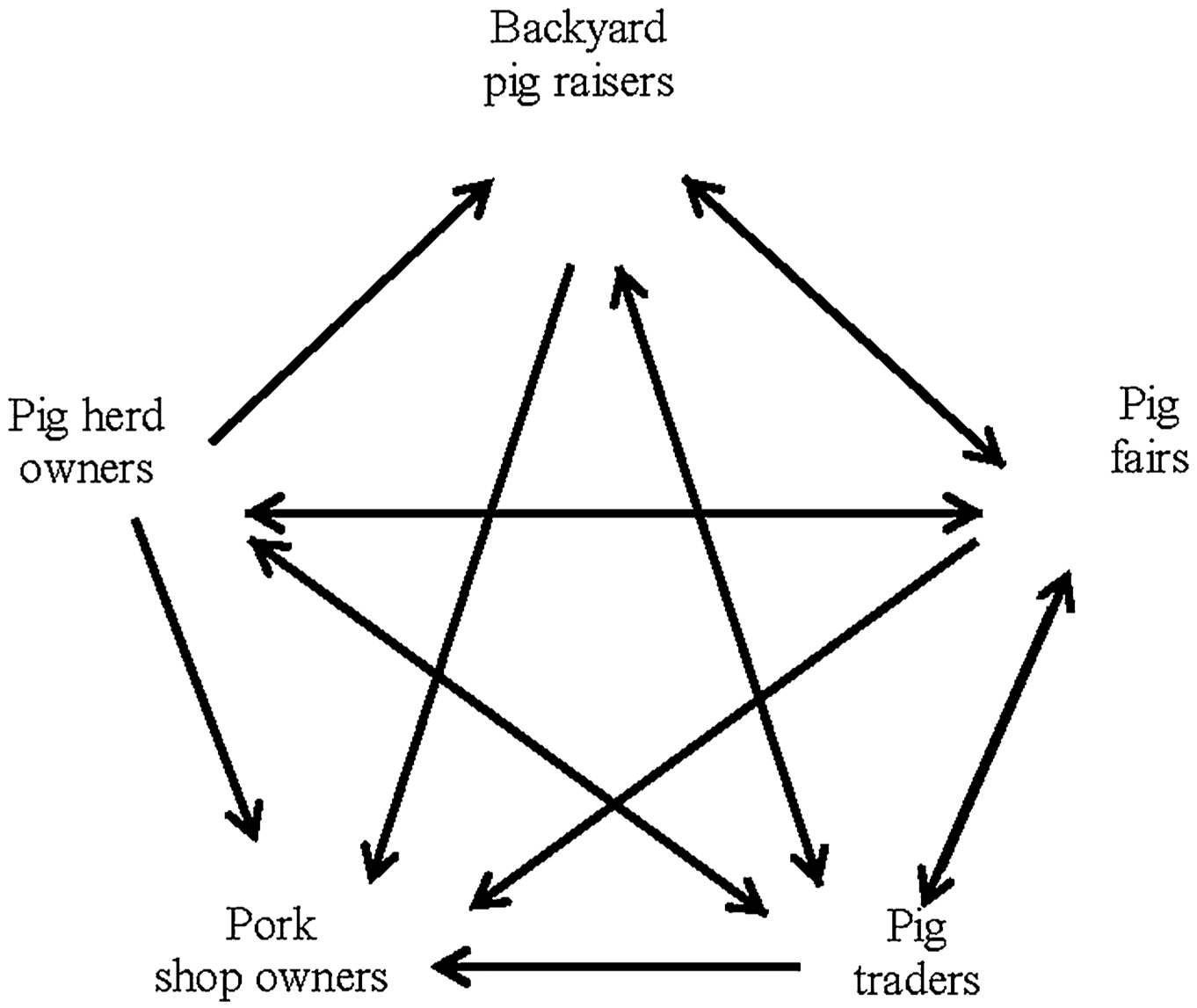

Figure 1.
Pig Market network according to study informants. *Lines with one arrowhead* represent one-way movement and *two arrowheads* represent two-way movement of pigs.

Table 1

Medicinal, Magical and Spiritual, and Material Uses of Pig Products Mentioned by Study Informant Pig Raisers from the Study Areas in Bangladesh in 2007–2008.

Pig and product	Type of use	Description of use	Respondents religion
Pig body parts			
Blood	Religious	Raw consumption with liquor as an offering	Hindu
Meat	Culinary	Cooked for human consumption	Hindu and Christian
Brain	Culinary	Slightly roasted for children's consumption	Hindu and Christian
Thick layer of skin	Culinary	Sliced for raw human consumption	Hindu
Pig bile	Medicinal	Humans swallow raw to treat gastric and night blindness	Hindu
Pig jaw bone	Medicinal	Treatment of tonsillitis in humans. Jaw bone paste is smeared on where the patient feels pain	Hindu
Liver	Religious	Used in rituals and austere religious practices to gain spiritual power among Hindus	Hindu
	Medicinal	Consumed freshly cooked for treatment of chronic diarrhea.	Hindu
	Culinary	Slightly roasted for children's consumption	Hindu and Christian
Intestine	Material	Make drum (*dhol*) which is an essential musical instrument for ceremonies	Hindu
Teeth of male pig	Magical	Prevent 'evil' and perform 'black' magic	Hindu
Tongue	Religious	Used in rituals as an offering and austere religious practices to gain spiritual power among Hindus	Hindu
Male genital (testicles)	Magical	Perform ritual and increase sexual power	Hindu
Hair	Magical	Prevent 'evil' and perform 'black' magic	Hindu
	Material	Used to make shoe brush	Hindu
Pig products			
Pig oil (oil from pig fat)	Medicinal	Apply on ringworm infection and ear infection of cattle; feed to cattle if they refuse to eat regular food; apply on burns or sprained leg in humans; apply to reduce arthritis pain in humans	Hindu
	Culinary	Cook curry	Hindu and Christian
Pig feces	Medicinal	Apply on ringworm infection, skin disease and foot and mouth disease of cattle and pigs	Hindu and Christian
	Magical	Make amulet and hang from cows' neck to produce milk	Hindu
	Material	Used as fertilizer and to feed fish	Hindu and Christian
Pig milk or urine	Medicinal	Apply a drop of pig milk or urine in the ear to treat children's ear infection	Hindu
Pig itself and materials related to pig raising			
Piglets	Medicinal	Woman holds piglet on her abdomen and/or wade herself into water with the piglet to cure infertility	Hindu
Mud from pigsties	Medicinal	Apply on ringworm infection of cattle	Hindu
	Magical	Perform rituals, prevent 'evil' and perform 'black' magic	Hindu
Stick that herders use to give direction	Medicinal	The pealing of the stick is used in an amulet to stop children urinating in the bed at night and to cure toothache. Touch the	Hindu

Medicinal medicinal use for healing, *Magical* magical and spiritual use, *material* material use, *Culinary* culinary use.