

Evaluation of smallholder pig production systems in North Vietnam: Pig production management and pig performances

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Abstract

This study investigated the productive adaptability of pig breeds under different smallholder production conditions in Vietnam, comparing an indigenous with a Vietnamese improved breed. Fieldwork was conducted in four villages with different remoteness in North Vietnam from 2001 to 2002, in 64 households keeping the improved Mong Cai or indigenous Ban as sow breeds and progeny for fattening. Four visits per farm yielded 234 structured interviews. Reproductive performances were derived from 135 litters. Individual weights of pigs ($n=755$) were obtained. Data were analysed by regression, linear and generalised linear, especially loglinear models.

Two distinct pig production systems were identified, that differed in remoteness, market access, resource availability, distribution of pig breeds and pig production intensity. Higher performances of 1.4 and 1.5 litters year⁻¹, 8.4 and 8.4 piglets weaned litter⁻¹, 66.6 and 93.0 kg piglets weaned sow⁻¹ year⁻¹, and 136 and 177 g day⁻¹ ADG were found in two villages near town with semi-intensive production conditions and a high rate of improved Mong Cai sows and MC and LW × MC offspring in the observed population. Lower performances of 1.1 and 1.1 litters year⁻¹, 4.6 and 5.5 piglets weaned litter⁻¹, 20.5 and 30.9 kg piglets weaned sow⁻¹ year⁻¹, and 66 and 85 g day⁻¹ ADG were observed in parallel to higher incidences of indigenous Ban pigs away from town under extensive conditions. Total live weight offtake per household per year was higher near town and in one village distant to town. MC and LW × MC remained even under demand-driven conditions below the performance potential reported for improved genotypes. Under resource-driven conditions with a saving-oriented production pattern, the higher-yielding but more demanding Mong Cai might not be an efficient production alternative as a further performance reduction can be assumed. A considerable live weight output was observed under resource-driven conditions and with a higher percentage of crossbred LW × Ban offspring in the population, possibly representing a promising production alternative. Factors influencing the performance expression of pigs, and the suitability of different methods for the assessment of performance parameters on-farm are discussed.

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1. Introduction

Vietnam owns 23 million pigs; the largest herd in SE Asia (FAOSTAT, 2004). 71% of farm households own pigs (MARD and UNDP, 2003). Pork accounts for

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70% of all livestock products (Lich, 1999). Up to 80% of pig production are estimated to be small-scale (Lapar et al., 2003). Smallholders typically own one or two sows and less than 10 fatteners (Lapar et al., 2003). Pigs contribute between 9% and 41% of the total income of pig keeping smallholder households in North Vietnam (Le Coq et al., 2002).

The North West of Vietnam (provinces Son La, Lai Chau, Hoa Binh) has a relatively low per-capita-income and income density from pig production, but is one of the regions with the highest share of household income derived from pigs (Epprecht, 2005). Compared to the lowlands, the North Western mountainous area is generally marginalised (Jamieson et al., 1998). Yet, it is not a homogeneous region. In densely populated mountain valleys, cropping is progressively limited by high land pressure, but farmers have increasing access to infrastructure and markets. Semi-intensive pig production is driven by the market-demand for pork (Steinfeld and Mack, 1997). Improved Vietnamese Mong Cai pigs as well as imported breeds have replaced the indigenous Ban breed (Lemke et al., 2002). Hillsides and hilltops are less densely populated; land pressure is lower. Infrastructure and markets are less available and accessible. Low-input pig production has both income-generating and socio-cultural functions and is driven by the availability of farm resources (Steinfeld and Mack, 1997). The local Ban breed still prevails, but is increasingly replaced by improved genotypes (Lemke et al., 2002). Breeds are named “improved/unimproved” to indicate their assumed performance level and the intensity of the breeding process leading to their current form of appearance (Lemke et al., 2000).

It is assumed that keeping improved pig breeds yields a higher cash revenue due to the pigs’ higher biologic performances and resulting higher output, but implies an economic risk especially for resource-poor farmers due to higher input requirements. As appropriate breeds are decisive factors for efficient resource use within specific production systems, it is aimed to analyse the suitability of breeds for the two production systems described above. In the first step, this study describes in a holistic approach the two production systems and assesses the performance of breeds under prevailing production conditions, thus, their productive adaptability (Horst, 1983).

2. Material and methods

2.1. Villages, households, animals

Fieldwork was conducted in the mountainous province Son La, NW Vietnam. Only 9% of the province area is

agricultural land (GSO, 2001). The infrastructure is poorly developed. The GDP is about \$126 per capita, one-third of the Vietnamese average of \$408 per capita (Statistical Department Son La, 2000; GSO, 2001). The population is dominated by ethnic minorities, with ethnic Thai accounting for 55% of the population (Kinh: 20%, H’mong: 10%, and other ethnic groups) (van der Poel and Khiem, 1993).

Four Black Thai villages were selected based on their distance to town, altitude and pig production intensity. Villages Ban Buon and Ban Bo are located in a mountain valley near the province capital Son La town. Markets and services are available in Son La town and are easily and regularly accessed by farmers. Pig production is driven by the market-demand for pork. Villages Na Huong and Bo Duoi are located at a hillside relatively far away from Hat Lot, capital of Mai Son district. The distance between Son La town and Hat Lot is about 30 km, the towns are connected by a tarmac road, the arterial road of the province. Communication from the villages to Hat Lot is hampered by the sloped road of poor quality. Markets and services are available in Hat Lot to a minor degree and are less regularly accessed by farmers. Pig production is driven by the availability of farm-owned resources. However, besides similarities specific for the pig production system, villages of each system showed differences in other, non-pig production aspects, as well as gradation processes in pig and agricultural production. Therefore, results are presented by village along with indication of the system.

Stratified household selection aimed to include only households with purebred Mong Cai or Ban sows in late pregnancy or lactation. To balance sample size and avoid distortion of real conditions, few households keeping crossbred sows were included. A total of 64 households of ethnic Black Thai were selected. Table 1 summarises the number of interviews and measurements over 2 years of study.

The distribution of genotypes in selected villages was unbalanced, with MC/LW × MC dominating near town and Ban/LW × Ban dominating away from town, impeding the separate estimation of genetic and environmental effects and their interactions, as village effects were largely confounded with breed effects and vice versa. For this reason, both management practices as well as performance data were analysed for village-specific differences confounded with breed effects. The impact of the village-specific distribution of genotypes on the observed performance levels is discussed.

2.2. Methods

Each farm was visited four times between March 2001 and July 2002. Two out of four farm visits were in a season

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