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INTENSIVE ANIMAL PRODUCTION IN AN URBAN AREA IN JAPAN

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I. HISTORICAL REVIEW OF ANIMAL PRODUCTION IN JAPAN

Up until one hundred and fifty years ago, Japan was closed to the outside world and its 30,000,000 people were dependent on domestic rice production. There was no custom of using domestic animals for food. At that time we have no pigs, sheep or goats, but there were native horses and cattle. Horses were used for draft and sometimes for horseback riding. Cattle were mainly used as plow animals for rice production in the paddy fields. Tawnsent Harris, the first US ambassador to Japan, who had lived in Yokohama, wanted to drink milk every day. At that time, nobody could supply it, since there were no cows for milking and no techniques. He asked an officer if he could keep milking goats in a field around his house, but the officer replied that he could not keep goats in a field, only inside a house. It was our custom, that animals should be kept in a pen. Nowadays, nobody would be surprised by the ambassador's request. The reasons for keeping animals at that time were totally different from contemporary Japan.

The country was opened to foreigners in 1854, after that the population has rapidly increased and has now reached 120,000,000. In the last 150 years Japanese people have changed their habits dramatically. Now they drink milk and eat beef, pork, lamb, mutton and milk products. To sustain this population our options are either to import a lot of animal meat and milk products or feed stuffs for domestic animal, egg and milk production. Table 1 shows the state of feed stuff supply in Japan.

II. STATE OF ANIMAL PRODUCTION IN JAPAN

Table 2 shows the consumption of animal meat in Japan. The consumption of animal meat in Japan is between one half and one third of that of western countries, however, when fish meat consumption is included, the total meat consumption is comparable to those of those countries. Table 3 shows meat supply in Japan: beef consumption is 1.2, pork is 2.1 and chicken is 1.75 million tons. The proportions of beef, pork and chicken that are imported is 50.4%, 31.8%, and 11.3% , respectively. To satisfy the remaining domestic demand, we keep 5 million cattle, one half for beef the other for dairy, 11 million pigs and 300 million chickens: one half as layers the other as broilers (Table 5). We can not supply enough feed stuffs to sustain this number of

domestic animals. Table 6 shows the state of animal feed supply in Japan. The amount of imported animal feed has increased by ten fold in the last thirty years, reaching 17 million tons TDN (total digestible nutrient). This table adds data on rice production for human consumption. The yearly importation of animal feed stuffs is now almost twice the production of rice in Japan, even though rice is the main crop in Japan. Domestic feed stuff production is only 24% of the total, which means our domestic animals are largely dependent on imported feed stuffs. In the rural areas between urban areas, many animals are being kept in highly intensive production systems utilizing imported feed stuffs, in order to satisfy the domestic demands for animal products. Massive amounts of fresh manure are a by-product that makes these operations potentially unsustainable: the issue of 'pollution'.

III. HUGE FACILITIES ARE NECESSARY TO PROCESS MANURE IN ALL TYPES ANIMAL PRODUCTION IN JAPAN

To overcome this pollution problem, people are developing systems for handling manure. Already Prefectural governments have a legistlative requirement for counterplans against pollution by animal production operations in Japan, even in quite rural areas. Here I will show an example of huge manure processing facility which is operated by an organization of Kobe city.

Figure shows a map of Kobe city. The Rokko mountain divides the city into three area, the south (urban area) and the north and the west (both are rural areas). The table shows the population of the city: a total of 1.5 million people, most in the south. Farmers are only 0.2% in this overall population and this proportion only reaches 9% in the west. The population of the rural areas to the west and north of the central business district (CBD) are expanding and the number of non-farmers is increasing rapidly. In Japan farmers are classified into three classes: the specialized class which means all their income depends on agricultural produce; the first class which means farming with a side job; and the second class which means a person doing farming as a side job. Specialized farmers represent only 13% of the total. Animal production is relatively active both in the west and north of the city. The major agricultural product is flesh vegetables, followed by rice and then, beef and dairy, so on. There are about 7,000 beef cattle and 4,400 dairy cattle in the area. In the case of beef production, steers are kept in a pen using sawdust as litter, so sawdust mixed with manure is fermented in a sun-room to make fertilizer. Farmers who keep beef cattle generally treat manure from their animals themselves. On the other hand, dairy cattle are generally kept in a face-out style barn incorporation a stanchion stall. This allows the use of mechanical 'barn cleaning

systems', which collect urine separately from dung. Hence, dung is not mixed with sawdust or other moisture absorbers. Kobe city has established an organization specifically to treat this type of dung.

IV. AN EXAMPLE OF A FACILITY FOR HANDLING DAIRY MANURE WITHIN AN URBAN AREA

In this presentation with slides, I will give an example of a facility and techniques used to handle animal manure within an urban area. This facility demonstrates some features that might be advantageous for other animal production systems, localized within urban areas in other countries. This problem and solution would seem to have relevance and significance for the increased demand for animal production in Asia into the future.