Session 1: Sustainable Development of Animal Production

Long-term Projections of China's Ability to Feed Itself: Implications for Japan

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Projections to 2010, 2020 and 2030 of the demand for livestock products, number of livestock required, and China's ability to meet human food and animal feedstuffs requirements are presented. Included are domestic demand for aqua products and the impact of bourgeoning exports from aquaculture production. The focus in the presentation is on the rationale for why China—technically—could maintain its current level of self-sufficiency in animal and aqua products, if that is its policy. It is concluded that China can easily meet its energy based feedstuffs requirements but is, and will continue to increasingly be, a net importer of protein based feedstuffs. However, from an economic perspective, those imports are offset by net exports of specialty crop commodities and in particular of aquaculture products.

The research approach in the program, based on calculation of all animal (including aquaculture) requirements and availabilities on the basis of metabolizable energy (ME) and crude protein (CP), is due to the great diversity in types of feedstuffs, feeding values, production, and uses of them in China. That is the primary reason this non-deterministic simulation spreadsheet programmed model with 800 variables and more than 2,200 parameters, is sufficiently robust that projections, even as far back as the 1989-91 base period, are quite close to what has actually happened and why considerable confidence in the current projections is appropriate. The approach is unique as it allows detailed analysis of the impact from technology development and adoption on production.

Per capita consumption projections are founded on the economy growing at a moderately robust pace. Feedstuffs requirements and availabilities projections are relatively conservative in light of the great potential biotechnology can have on crop and animal production. Parameters are based on current known and adopted technologies in China and abroad for both crop yield increases and animal production. Constraints on China's natural resources including water availability, climatic changes leading to more cyclical fluctuations in crop production, and changes in feedstuffs use are taken into account.

Total meat consumption is projected to increase 40 percent over the three decades 2000-2030, and eggs 24 percent. However, due to structural changes in all segments of the livestock and aquaculture industries, coupled with productivity enhancement, the inventory of pigs and poultry is projected to decrease by 2030 compared with 2000. Work and other large animals will only constitute one fourth of the 2000 inventory, freeing up feedstuffs for alternative uses. Milk production per cow continues to be so low that, despite per capita consumption increasing

from 7 kg to 40 kg over the three decades dairy cow inventory will ultimately be only marginally higher than current levels.

Beef cattle productivity is projected to increase 75 percent from 2000 to 2030 but feedstuffs required per kg of beef produced will only decrease marginally resulting in substantial feed requirement increases. Government policies are very important for beef production as government has focused on promotion of enhanced quality nonconventional feed resources (NCFR), particularly treated fodder such as corn stalks. These NCFR are the primary feedstuffs for ruminants so that, if policies change to promote greater use as a cellulosic feedstock or as an energy source for production of bio-ethanol it can have a significant impact on protein imports.

Aquaculture accounts for one fourth of all China's feedstuffs protein requirements. Continued growth in production area and use will lead to substantial protein based imports. If the changes in beef and aquaculture feedstuffs use are modest, soybean imports (which account for the vast majority of imported protein sources) will grow from about 35 million tons currently, to 60 million tons in 2020.

Study of China's animal and aquaculture sectors from a feedstuffs perspective leads to ideas in which Japan can enhance its food self-sufficiency level (now at 40 percent). One example stems from incorporation of China's bio-ethanol program in the projection modeling. Sweet sorghum is the primary feedstock and enormous tonnages are produced (around 70 tons of stalks plus 4 tons of grain per hectare). To get an idea of the potential impact it could have consider Japan's increasing problem of abandoned land (currently about 10 percent of all arable land). If sweet sorghum, which is an excellent ruminant animal feedstuff and is widely used around the world, was planted on just half of the abandoned land, from a nutritional perspective it would be sufficient to meet most of the feed requirements for all of Japan's beef cattle production.

On a cautionary side, China has pro-export policies for its agricultural and aqua product sectors and has the ability to adjust its production to meet opportunities. If Japan is forced to reduce its import tariffs to any significant degree in this Doha Round of WTO trade negotiations, or in future rounds or bilateral treaties, China would likely take advantage of the opportunity to increase its share of Japan's food imports.

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Note: publications by Simpson are largely available at www.jamesrsimpson.com.

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