

## Tables

*Table 1: Total production of agricultural products in Denmark, 1996, and in the organic scenarios (Alrøe et al. 1998a; Danish EPA 1999a)*

|                                  | Danish agriculture 1996 | Organic scenarios   |            |           |                      |            |           |
|----------------------------------|-------------------------|---------------------|------------|-----------|----------------------|------------|-----------|
|                                  |                         | Present yield level |            |           | Improved yield level |            |           |
|                                  |                         | No import           | Restricted | Unlimited | No import            | Restricted | Unlimited |
| Grain (mill. FU) <sup>a</sup>    | 9,850                   | 3,678               | 4,549      | 4,785     | 4,581                | 5,448      | 5,506     |
| Grass etc. (mill. FU)            | 3,269                   | 5,311               | 5,165      | 5,060     | 5,721                | 5,525      | 5,495     |
| Fodder beets (mill. FU)          | 440                     | 537                 | 537        | 537       | 440                  | 537        | 537       |
| Rape (mill. kg)                  | 251                     | 271                 | 0          | 0         | 247                  | 0          | 0         |
| Grass seed (mill. kg)            | 64                      | 13                  | 13         | 13        | 13                   | 13         | 13        |
| Potatoes (mill. kg) <sup>b</sup> | 1,617                   | 327                 | 327        | 327       | 327                  | 327        | 327       |
| Sugar (mill. kg) <sup>c</sup>    | 493                     | 225                 | 225        | 225       | 225                  | 225        | 225       |
| Vegetables (mill. kg)            | 291                     | 291                 | 291        | 291       | 291                  | 291        | 291       |
| Fruit and berries (mill. kg)     | 61                      | 61                  | 61         | 61        | 61                   | 61         | 61        |
| Milk (mill. kg)                  | 4,690                   | 4,650               | 4,650      | 4,650     | 4,650                | 4,650      | 4,650     |
| Beef (mill. kg)                  | 198                     | 202                 | 195        | 190       | 207                  | 199        | 197       |
| Pork and poultry (mill. kg)      | 1,773                   | 531                 | 1,255      | 1,773     | 793                  | 1,645      | 1,773     |
| Eggs (mill. kg)                  | 88                      | 88                  | 88         | 88        | 88                   | 88         | 88        |

FU: International feed units

<sup>a</sup> Grain for feed, seed and human consumption, including pulses.

<sup>b</sup> Potatoes including laying potatoes (and, for Danish agriculture 1996, potatoes for industry)

<sup>c</sup> Refined sugar

*Table 2: Danish feed import and export of agricultural products in 1996 and in the organic scenarios (Alrøe et al. 1998a; Danish EPA 1999a)*

|  | Danish agriculture 1996 <sup>a</sup> | Organic scenarios   |            |           |                      |            |           |
|--|--------------------------------------|---------------------|------------|-----------|----------------------|------------|-----------|
|  |                                      | Present yield level |            |           | Improved yield level |            |           |
|  |                                      | No import           | Restricted | Unlimited | No import            | Restricted | Unlimited |
| Feed import (mill. FU) <sup>b</sup>      | 3,513                                | 0                   | 2,300      | 4,158     | 0                    | 2,715      | 3,176     |
| Grain (mill. kg)                         | 2,022                                | 0                   | 0          | 0         | 0                    | 0          | 0         |
| Rape (mill. kg)                          | 58                                   | 0                   | 0          | 0         | 0                    | 0          | 0         |
| Grass seed (mill. kg)                    | 61                                   | 0                   | 0          | 0         | 0                    | 0          | 0         |
| Potatoes (mill. kg)                      | 421 <sup>c</sup>                     | 0                   | 0          | 0         | 0                    | 0          | 0         |
| Sugar (mill. kg)                         | 160                                  | 0                   | 0          | 0         | 0                    | 0          | 0         |
| Milk (mill. kg)                          | 2,352                                | 2,312               | 2,312      | 2,312     | 2,312                | 2,312      | 2,312     |
| Beef (mill. kg) <sup>d</sup>             | 96                                   | 100                 | 93         | 88        | 105                  | 97         | 95        |
| Pork and poultry (mill. kg) <sup>e</sup> | 1,342                                | 100                 | 824        | 1,342     | 362                  | 1,214      | 1,342     |
| Eggs (mill. kg) <sup>f</sup>             | 6                                    | 6                   | 6          | 6         | 6                    | 6          | 6         |

<sup>a</sup> The figures for export of crop products in 1996 are only to be taken as indicative, since there are large yearly variations.

<sup>b</sup> Grain constitutes app. 10% of the feed import in 1996, but more than 50% of the feed import in the organic scenarios.

<sup>c</sup> Including the share exported as potato flour.

<sup>d</sup> Calculated as production i slaughtered weight minus national consumption (102 mill. kg); exclusive the export of 54,500 heads of cattle in 1996, corresponding to 3 mill. kg live weight.

<sup>e</sup> Calculated as production i slaughtered weight minus national consumption (431 mill. kg); exclusive the export of 692,000 heads of pigs in 1996, corresponding to 33 mill. kg live weight.

<sup>f</sup> Calculated as production minus laying eggs (10 mill. kg) and national consumption (72 mill. kg)

Table 3: Nitrogen balances in 1996, after the implementation of the plan for the aquatic environment (VMP 2), and in the organic scenarios (mill. kg per year) <Grant 1998; Danish EPA 1999b>

|                              | Danish agriculture 1995/96 | VMP 2      | Organic scenarios   |                  |                  |                      |                  |                  |
|------------------------------|----------------------------|------------|---------------------|------------------|------------------|----------------------|------------------|------------------|
|                              |                            |            | Present yield level |                  |                  | Improved yield level |                  |                  |
|                              |                            |            | No import           | Restricted       | Unlimited        | No import            | Restricted       | Unlimited        |
| Feed , etc.                  | 205                        | 179        | 6                   | 94               | 148              | 18                   | 109              | 122              |
| Art. fertilizer              | 285                        | 177        | 0                   | 0                | 0                | 0                    | 0                | 0                |
| Sludge, waste                | 9                          | 9          | 0                   | 0                | 0                | 0                    | 0                | 0                |
| Atm. deposition <sup>a</sup> | 57                         | 57         | 57                  | 57               | 57               | 57                   | 57               | 57               |
| Fixation                     | 30                         | 31         | 159 <sup>b</sup>    | 159 <sup>b</sup> | 159 <sup>b</sup> | 177 <sup>b</sup>     | 177 <sup>b</sup> | 177 <sup>b</sup> |
| <i>N input</i>               | <i>586</i>                 | <i>452</i> | <i>222</i>          | <i>310</i>       | <i>364</i>       | <i>253</i>           | <i>343</i>       | <i>357</i>       |
| Crop products                | 63                         | 42         | 19                  | 19               | 19               | 19                   | 19               | 19               |
| Animal products              | 105                        | 105        | 58                  | 82               | 100              | 66                   | 96               | 100              |
| <i>N output</i>              | <i>168</i>                 | <i>147</i> | <i>76</i>           | <i>100</i>       | <i>118</i>       | <i>85</i>            | <i>114</i>       | <i>119</i>       |
| <i>N balance</i>             | <i>418</i>                 | <i>305</i> | <i>146</i>          | <i>209</i>       | <i>245</i>       | <i>167</i>           | <i>229</i>       | <i>238</i>       |
| Ammonia loss <sup>c</sup>    | 76                         | 69         | 45                  | 57               | 67               | 50                   | 65               | 67               |
| <i>N to the soil, net</i>    | <i>342</i>                 | <i>236</i> | <i>101</i>          | <i>152</i>       | <i>178</i>       | <i>117</i>           | <i>164</i>       | <i>171</i>       |

<sup>a</sup> The same atmospheric deposition is used in all scenarios, not incorporating the consequences of the changes in ammonia loss following from the changes in livestock.

<sup>b</sup> An estimate for the uncertainty on the size of the fixation in the organic scenarios has been calculated to 56 mill. kg.

<sup>c</sup> The calculation is based on estimates for N ab anima, estimates for ammonia loss and denitrification in housings and stocks, in the delivery of manure, and in grazing. These losses are dependent on the production system. Furthermore there is a loss of ammonia from crops (11 mill. kg). In 1995/96 and the VMP 2 scenario there is furthermore a loss from artificial fertilizer (7 mill. kg) and from the ammonia treatment of straw (4 mill. kg).

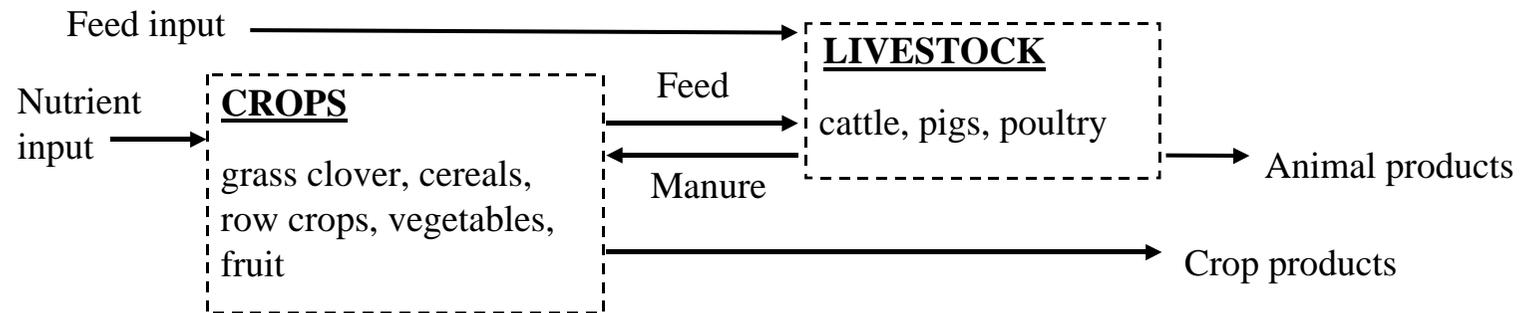
Table 4: Consumption of fossil energy in Danish agriculture and the organic scenarios, compared with crop and animal production <Dalgaard et al. 1998, Danish EPA 1999b>.

|   | Danish agriculture 1996 | Organic scenarios   |            |           |                      |            |           |
|---|-------------------------|---------------------|------------|-----------|----------------------|------------|-----------|
|   |                         | Present yield level |            |           | Improved yield level |            |           |
|   |                         | No import           | Restricted | Unlimited | No import            | Restricted | Unlimited |
| Crop product. (mill. FU)                  | 15,900                  | 11,000              | 11,400     | 11,600    | 12,300               | 12,800     | 12,900    |
| Crop product. (PJ ME) <sup>a</sup>        | 199                     | 138                 | 143        | 145       | 154                  | 160        | 161       |
| Number of animals (mill. Livestock Units) | 2.3                     | 1.7                 | 2.1        | 2.4       | 1.9                  | 2.3        | 2.4       |
| Energy for crop production (PJ)           | 37                      | 17                  | 17         | 17        | 17                   | 17         | 17        |
| Energy for animal production (PJ)         | 41                      | 13                  | 29         | 41        | 14                   | 31         | 37        |
| Total energy consumption (PJ)             | 78                      | 30                  | 46         | 58        | 31                   | 49         | 54        |
| Energy production (PJ)                    | 14 <sup>b</sup>         | 0                   | 0          | 0         | 0                    | 0          | 0         |
| Net consumption (PJ)                      | 64                      | 30                  | 46         | 58        | 31                   | 49         | 54        |

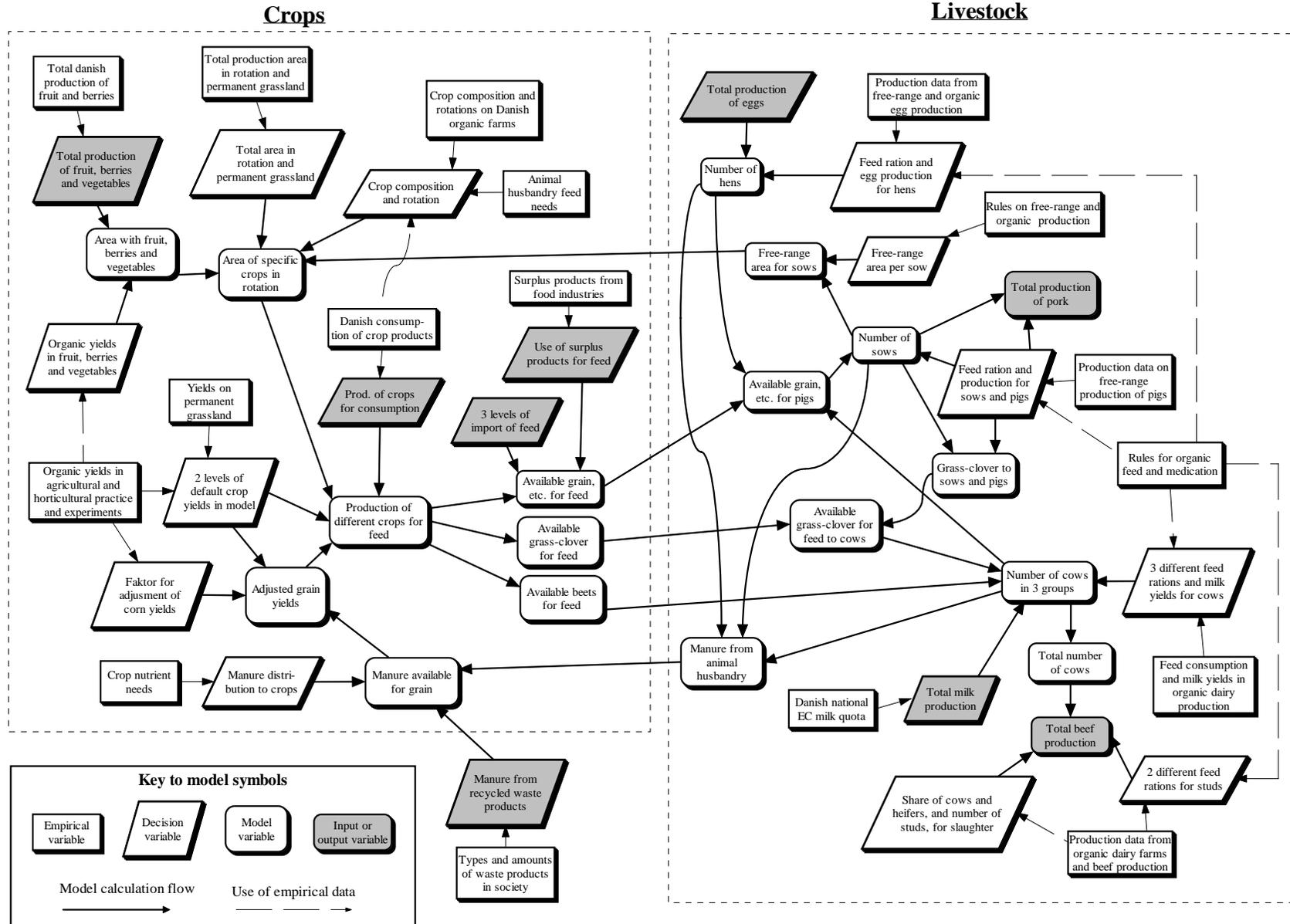
<sup>a</sup> Converted from feed units to metabolic energy (1 FU = 12,5 MJ ME).

<sup>b</sup> There is a potential for further energy production in the present agriculture, corresponding to the grain that was exported in 1996 (2000 mill. kg \* 15 MJ/kg = 30 PJ). The use of this potential will have other socioeconomic consequences.

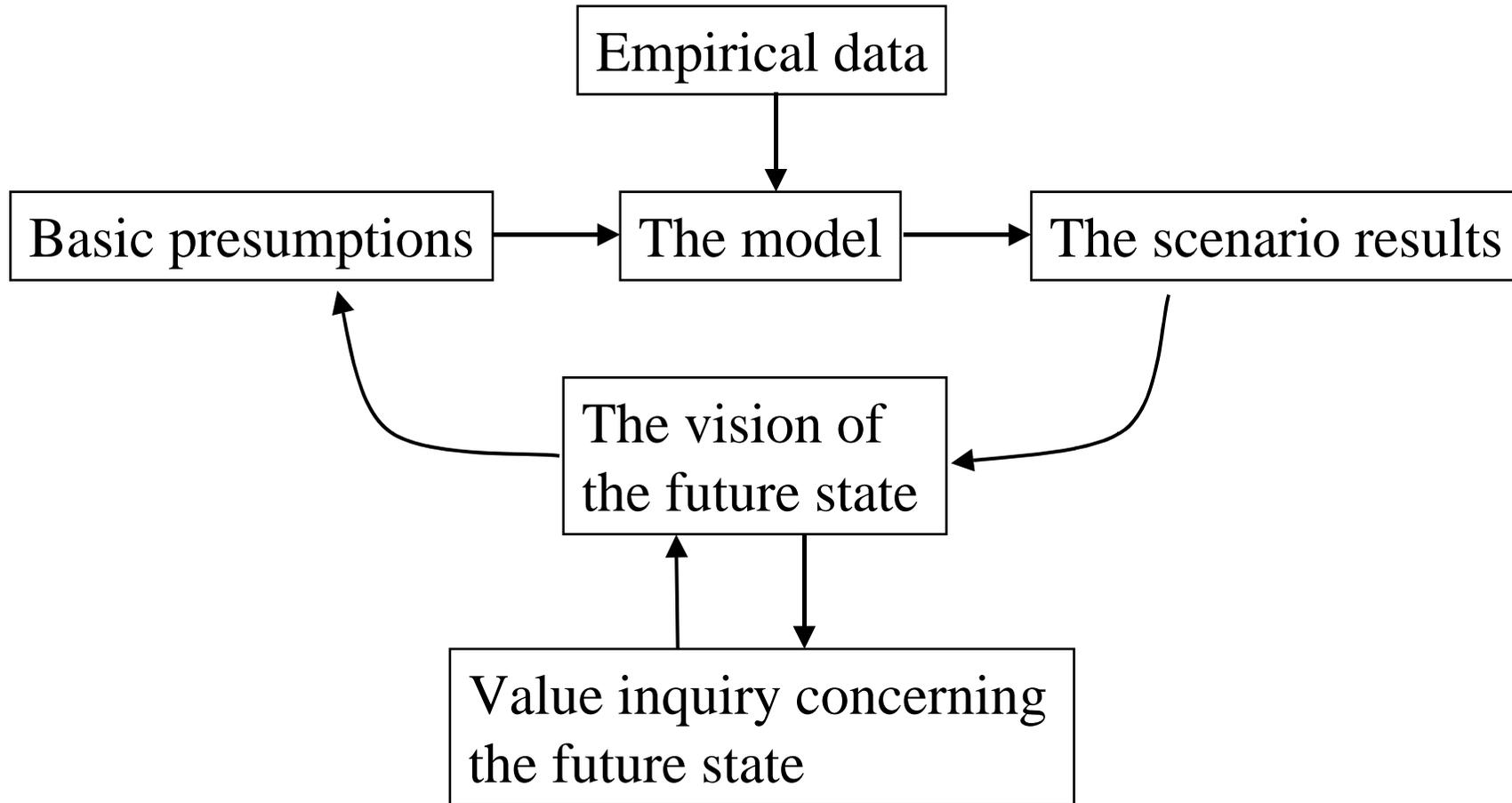
*Overall structure of the material flows in a model of an all-organic agriculture in Denmark*



The model for calculation of the organic scenarios.



*The relation between the modelling proces and the value inquiry  
in an assessment like the one performed by the Bichel Committee*



*Three elements in the development of organic agriculture: practice, preferences, and rules  
– all related to the basic organic principles and values as well as to conventional practice*

