



Organic Farming and the Energy Crisis: Saint or Sinner?

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Introduction.

- **Global position.**
- **Organic position.**
- **The future for organic systems.**

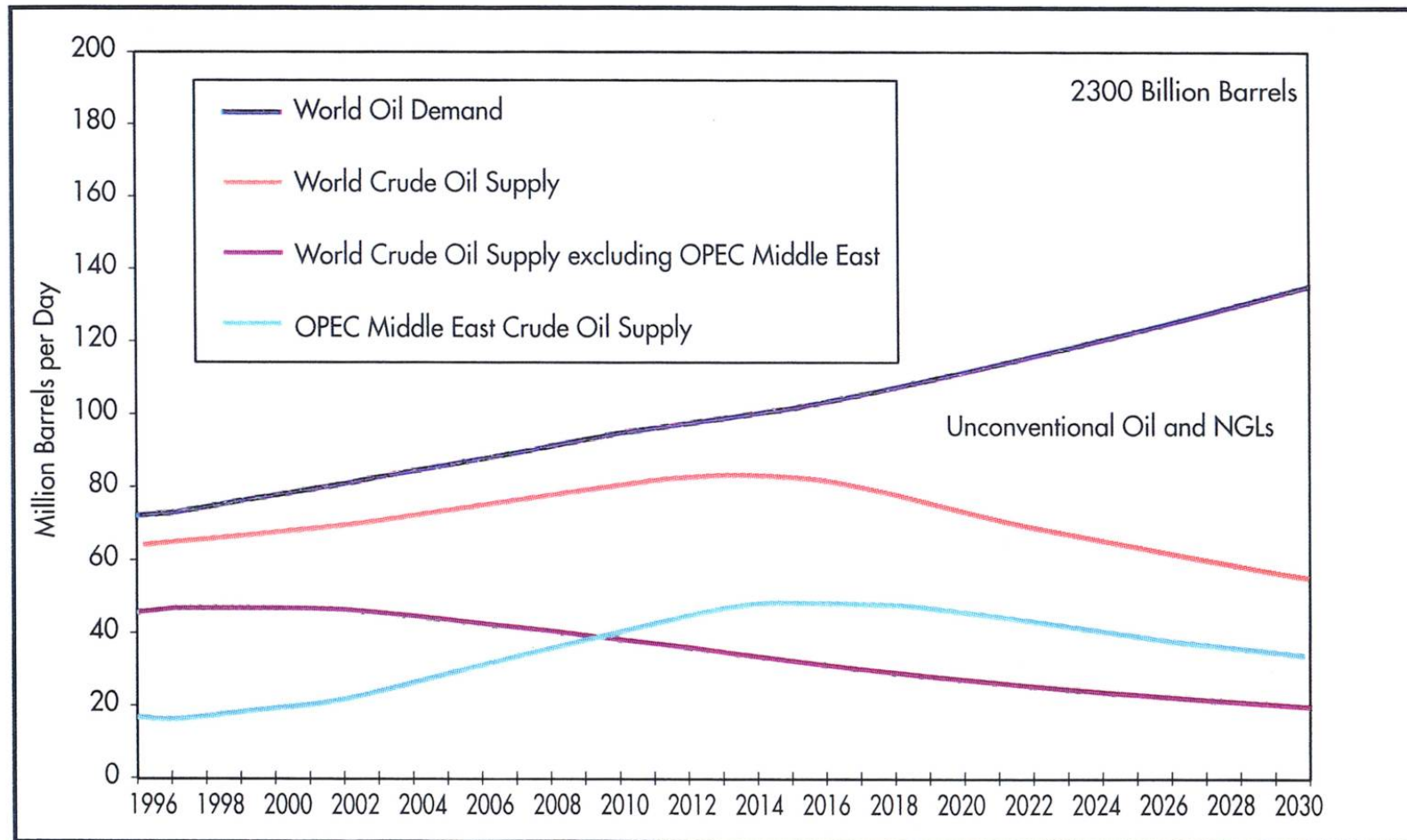


Global Warming Is Happening.

- The last decade was the warmest on record.
- “Extreme Weather Events” are occurring on an unparalleled scale.
- The polar icecaps are thinning at an unprecedented rate.
- Coral reefs are dying at a record rate.
- CO₂ emissions into the atmosphere at the highest levels ever recorded.



Oil Supply & Demand Profiles 1996-2030.



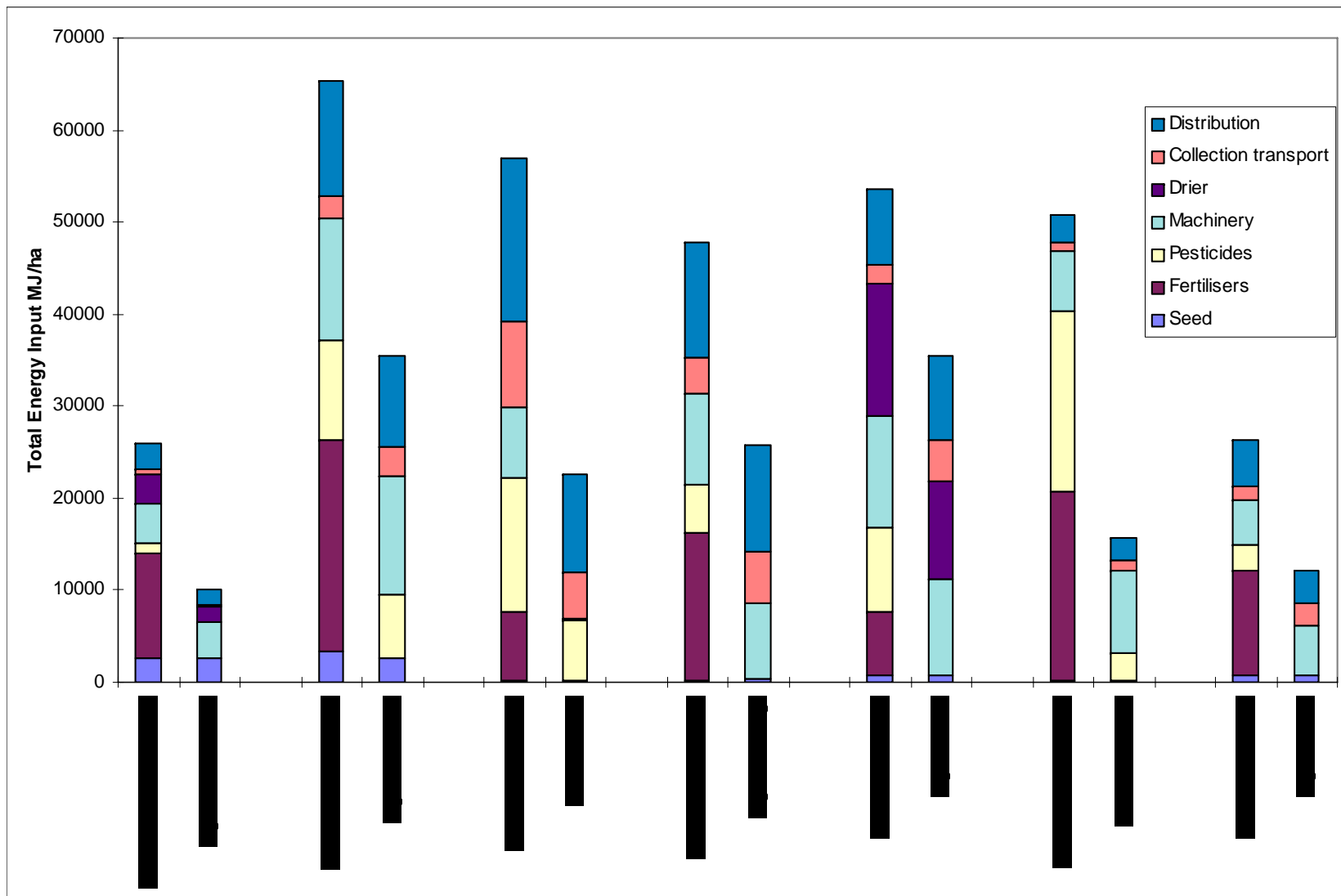


IFOAM Principles.

- Principle of Ecology.
- Principle of Health.
- Principle of Care.
- Principle of Fairness.

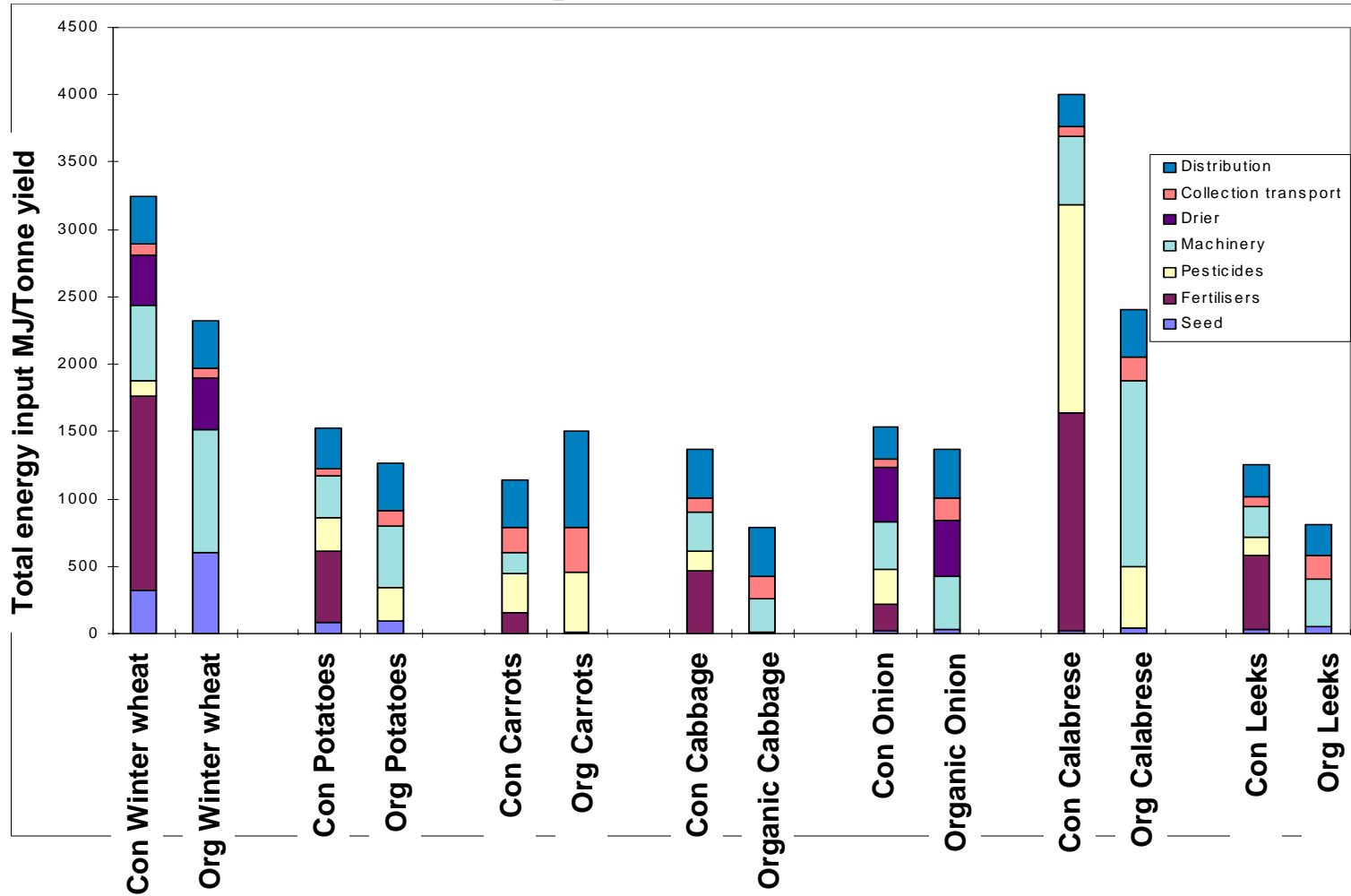


Energy Input By Category On An Area Basis.





Energy Input By Category On A Unit Output Basis.





Comparison of Overall Energy Ratios.

| | Conventional | Organic |
|------------------|--------------|---------|
| Mainly Arable | 3.58 | 5.54 |
| Stockless | 5.18 | |
| -Veg | | 4.41 |
| - Potatoes | | 4.37 |
| Upland Livestock | 1.00 | 2.27 |
| Dairy | 0.43 | 1.67 |

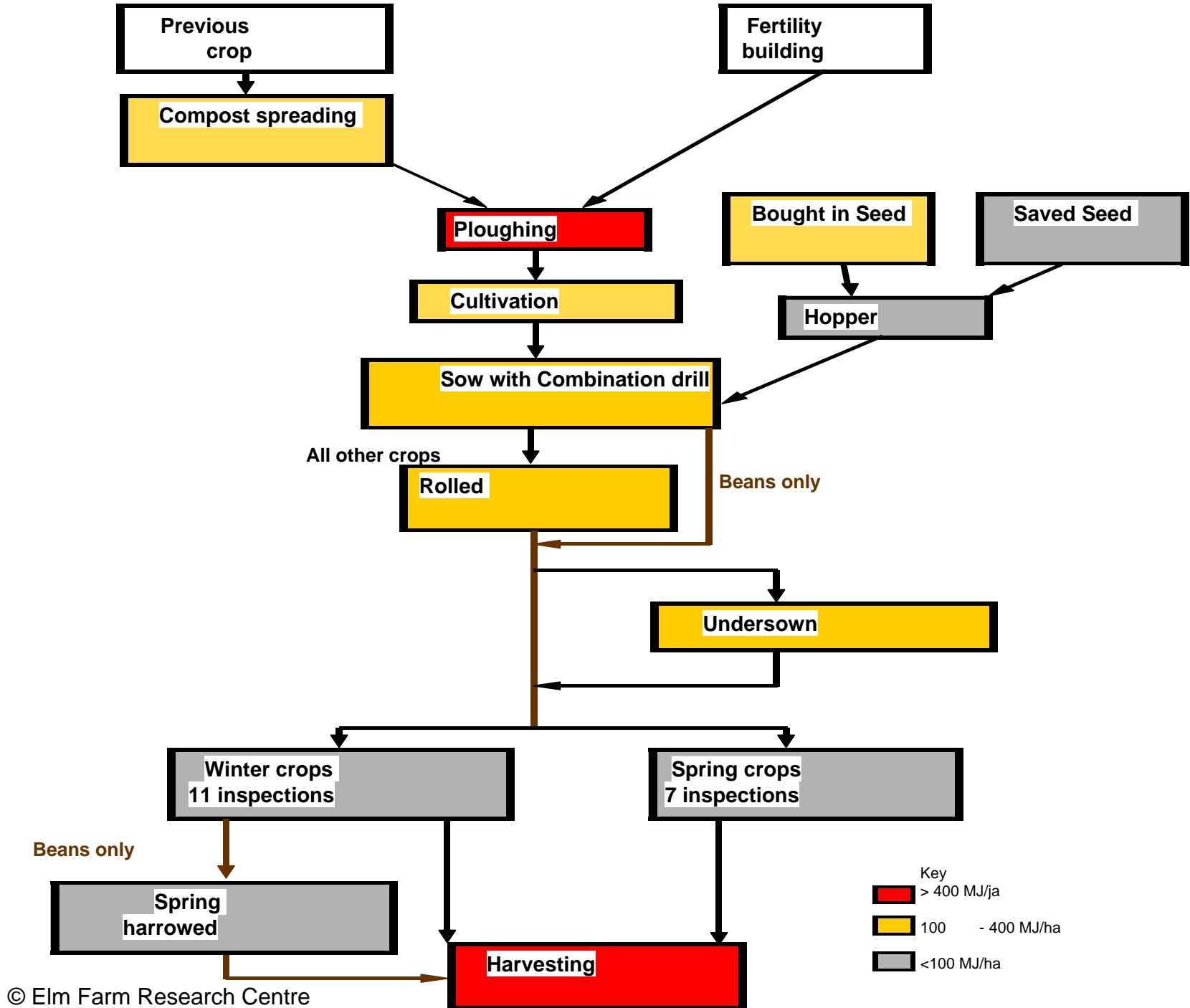
NB: Energy Ratio = Energy Output/Energy Input



On-farm Conclusions.

- **At the farm gate organic has a benefit over conventional.**
- **Greater per ha than kg output.**
- **We know organic farming is good but how can it be improved?**
- **Case study.**

Elm Farm Research Centre





Energy Use Arable Rotation.

| Crop Management Activity | MJ/ha for each activity |
|--------------------------------------|-------------------------|
| Soil Improvements | 188.80 |
| Ploughing | 1,534.00 |
| Other Cultivations | 236.00 |
| Seed Transport | 188.80 |
| Sowing | 165.20 |
| Rolling | 141.60 |
| Under-sowing | 177.00 |
| Crop Inspections | 16.80 |
| Combining | 1,534.00 |
| Post Harvest Cultivations | 236.00 |
| Dryer | 972.23 |
| Bailing | 283.20 |
| Bale Transport | 318.60 |
| Total energy used per ha (MJ) | 6,181.00 |



Case Study: Mitigation.

- **Short-term strategies.**
 - ◆ Maintenance of vehicles and equipment
 - ◆ Correct equipment for the task
 - ◆ Correct tyre pressures
 - ◆ Timeliness of operations
- **Longer-term solutions.**
 - ◆ Use of renewable energy sources eg micro-generation for grain driers



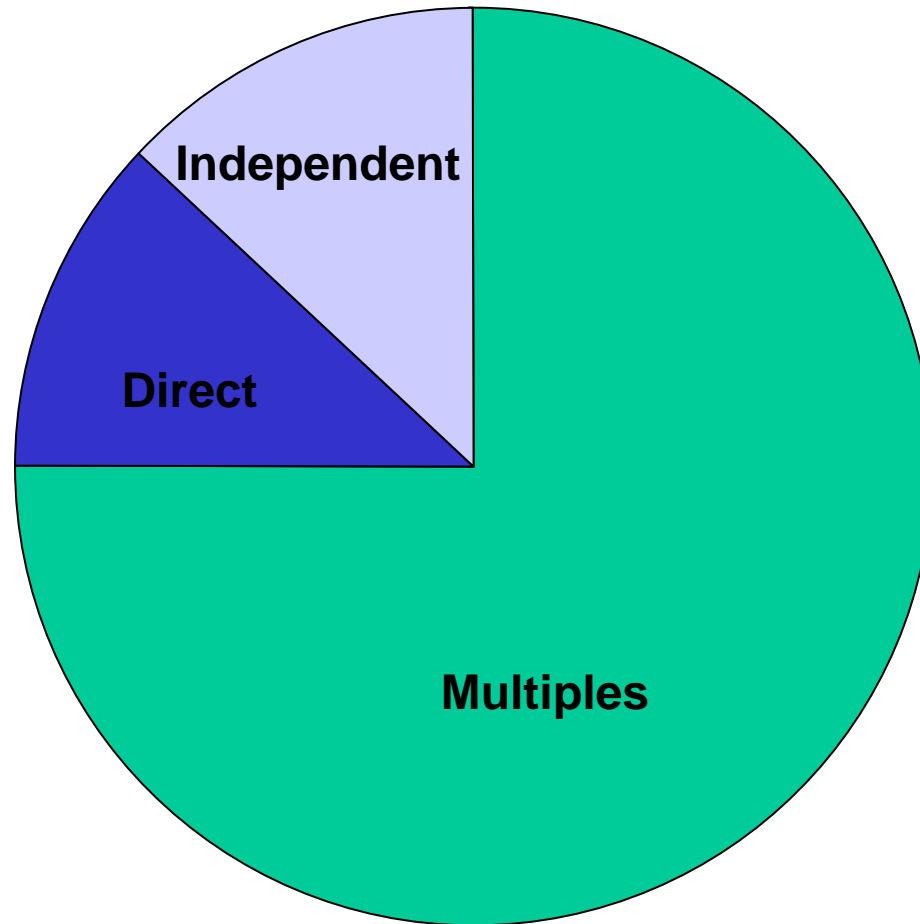
Post Farm Gate.

- **Organic food supply has followed a conventional route.**



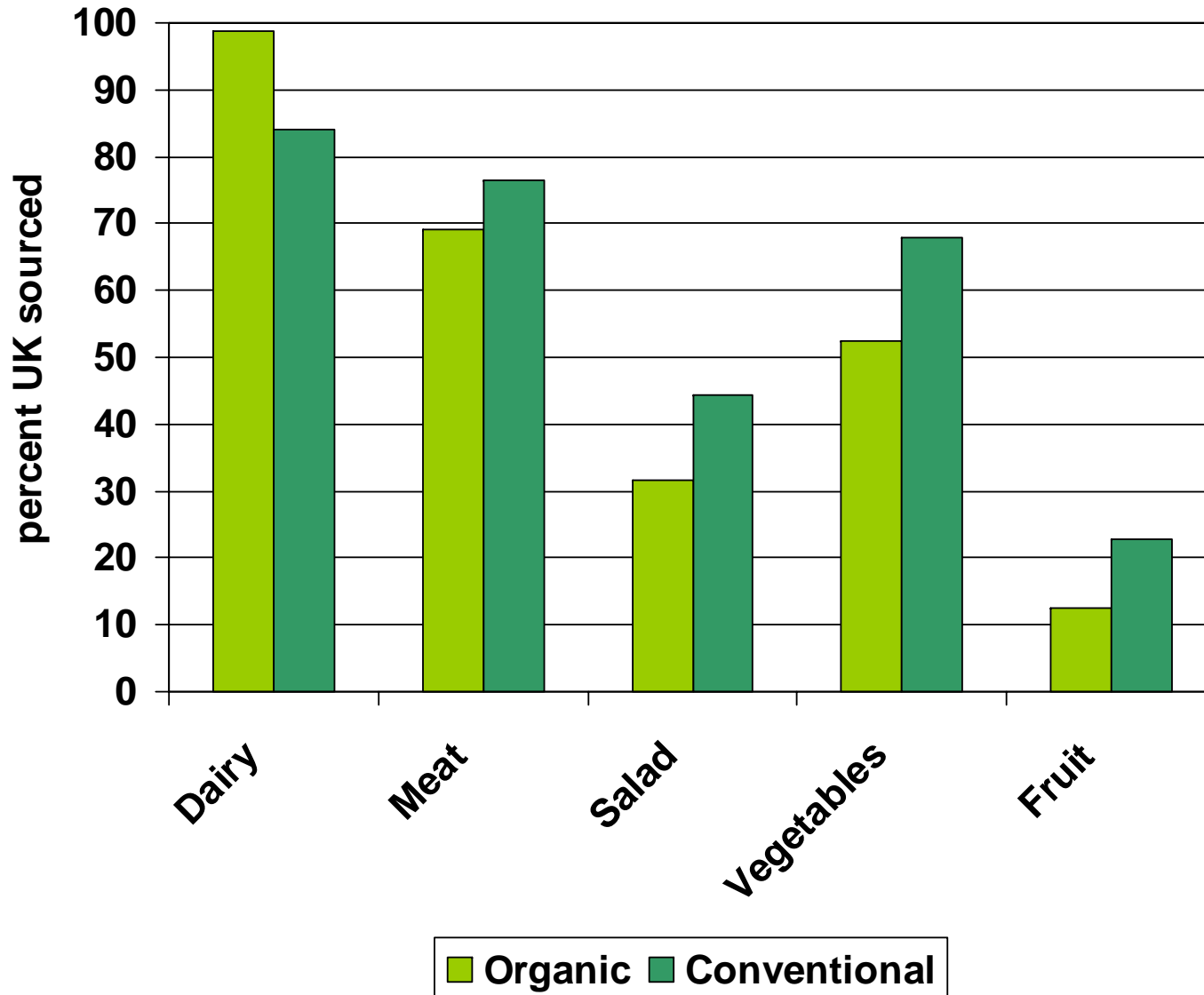
Where organic food is bought in the UK.

(Soil Association 2005)











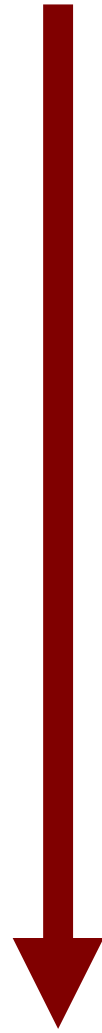
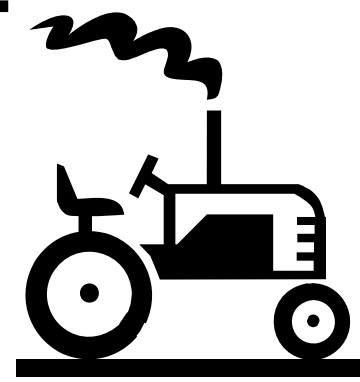
Multiple Retailer UK Sourced Produce 2003/04. (Soil Association 2005)





Possible steps!

- Farm gate Haulier 
-  Co-op Haulier
- Shipper 
-  Haulier Importer
- Haulier 
- Distribution centre Haulier
-  Haulier Retailer
- Car
- Home





Externalities of Production at the Farm Gate.

| Sources of adverse effects | Actual costs from current agriculture (£ M yr ⁻¹) | Scenario: costs as if whole of UK was organic (£ M yr ⁻¹) |
|--|---|---|
| Pesticides in water. | 143.2 | 0.0 |
| Nitrate, phosphate, soil and <i>Cryptosporidium</i> in water. | 112.1 | 53.7 |
| Eutrophication of surface water. | 79.1 | 19.8 |
| Monitoring of water systems and advice. | 13.1 | 13.1 |
| Methane, nitrous oxide, ammonia emissions to atmosphere. | 421.1 | 172.7 |
| Direct and indirect carbon dioxide emissions to atmosphere. | 102.7 | 32.0 |
| Off-site soil erosion and organic matter losses from soils. | 59.0 | 24.0 |
| Losses of biodiversity and landscape values. | 150.3 | 19.3 |
| Adverse effects to human health from pesticides. | 1.2 | 0.0 |
| Adverse effects to human health from micro-organisms and BSE | 432.6 | 50.4 |
| Total | £1514.4 | £384.9 |

J N Pretty et al (2005)



Proportion of Externality Costs Related to Production and Distribution.

| Externality | Conventional Agriculture Costs (£ M yr) | % of Total | Organic Agriculture Costs (£ M yr) | % of Total |
|--|---|------------|------------------------------------|------------|
| Agricultural externalities (on-farm) | 1514 | 29.3 | 385 | 8.7 |
| Domestic Road Transport (farm to shop) | 2348 | 45.5 | 2348 | 53.1 |
| Sea, Water and Air Transport for Imports | 17 | 0.3 | 17 | 0.4 |
| Shopping (Shop to Home) | 1276 | 24.7 | 1276 | 28.9 |
| Waste Disposal to Landfill | 7 | 0.1 | 7 | 0.1 |
| Total Externalities | 5162 | | 4418 | |



Future.

- **Local food for local market.**
- **Seasonality.**
- **Short-chain distribution/processing.**



Organic Farming: Saint or Sinner?

- **On-farm.**
 - ◆ **Saintly.**
 - ◆ **There is room for improvements.**

- **Off-farm.**
 - ◆ **Sinner.**
 - ◆ **Followed a conventional unsustainable route.**
 - ◆ **Radical change needed.**

