

Appendix 1. Pallet densities for food

| | Total pallet incl. pallet packaging) | Total pallet height (incl. pallet) | Pallet density |
|---|--|--|-------------------|
| FRUIT & VEGETABLES | | | |
| Products | 80 | 2. | 39 |
| Onion | 82 | 1. | 53 |
| Lettuce | 50 | 6.2 | 75 |
| Peas | 85 | 2 | 88 |
| Broccoli | 80 | 2. | 88 |
| Cauliflower | 80 | 2. | 88 |
| Carrot | 80 | 2. | 89 |
| White | 80 | 2. | 78 |
| Apples | 85 | 12 | 49 |
| Greenhouse | 2 | 5 | 3 |
| Potatoes (ordinary) | 67 | 1.8 | 38 |
| Tomatoes (ordinary round in returnable) | 67 | 2.8 | 88 |
| Small tomatoes (or other small) | 46 | 2.8 | 86 |
| Cucumbers | 58 | 5.7 | 34 |
| Cucumbers | 584/59 | 51. | 358 or 8 |
| Potatoes | 840/78 | 1.9/2.4 | 366 or |
| Peas in | 4 6 | 5 1. | 333 5 |
| Mixed lettuce in | 28 | 2. | 19 |
| bag | 0 | 2 | 8 |
| CEREAL | | | |
| Wheat | 77 | 1.1 | 69 |
| Ridge | 23 | 6.9 | 95 |
| Solun | 66 | 0.9 | 60 |
| Quick cook | 53 | 0.9 | 39 |
| Macaroni | 78 | 0.9 | 43 |
| Spaghetti | 71 | 0.9 | 75 |
| Tagliatelli | 96 | 9.0 | 76 |
| Smart & Gott | 85 | 4.8 | 89 |
| Macaroni wholemeal | 91 | 7.8 | 57 |
| Hotdog | 88 | 7.8 | 75 |
| rolls | 0 | 7 | 6 |
| MEA | | | |
| Fresh | 22 | 1.2 | 19 |
| Chicken | 87 | 4.2 | 29 |
| chicken | 7 | 5 | 8 |
| DAIRY | | | |
| PRODUCTS | 79 | 1.0 | 81 |
| Cheese | 46 | 0.9 | 78 |
| Margarin | 89 | 9.2 | 49 |
| Soft | 88 | 5.0 | 78 |
| Cheese | 85 | 6.8 | 30 |
| fraiche | 8 | 9 | 2 |
| FISH AND | | | |
| SEASONS, peeled, packed in | 69 | Assumed | 57 |
| Frozen cod fillet, frozen in individual | 89 | 1.25 1. | 75 |
| Frozen cod fillet, wet | 88 | 2. | 89 |
| Salmon | 31 | 12 | 30 |
| fish | 49 | 6.1 | 44 |
| gratin | 8 | 8 | 0 |

Appendix 2. Supporting data for calculating transport to central depot and supermarket

Table [A2.1]: Population divided on a county basis, (SCB, 2007)

| County name | Population |
|-----------------------|------------------|
| Sweden total | 9 182 927 |
| Dalarna | 275 618 |
| Västra | |
| Götaland | 1 547 298 |
| Värmland | 273 826 |
| Östergötland | 420 809 |
| Jönköping | 333 610 |
| Örebro | 276 067 |
| Blekinge | 151 900 |
| Skåne | 1 199 357 |
| Halland | 291 393 |
| Stockholm | 1 949 516 |
| Uppsala | 323 270 |
| Södermanland | 265 190 |
| Gotland | 57 122 |
| Gävleborg | 275 556 |
| Västernorrland | 243 449 |
| Jämtland | 126 937 |
| Västerbotten | 257 593 |
| Norrbotten | 250 602 |
| Västmanland | 249 193 |
| Kronoberg | 180 787 |
| Kalmar | 233 834 |

Assumed geographical
 for food
 Production/import
 Västra
 Östergötlan
 Mälardale
 Östersun
 Ume
 å

Table [A2.12]: Fraction of population served by assumed central depot and distance [(km)] for production/import to central depot

| | Assumed county for service | Total numbers relevant | Fraction of population | Distance from Skåne | Distance from Västra Götaland | Distance from Östergötlan | Distance from Mälardale | Distance from Östersun | Distance from Umeå |
|----------|----------------------------|------------------------|------------------------|---------------------|-------------------------------|---------------------------|-------------------------|------------------------|--------------------|
| BORLÅNG | Borlänge | 275 | 0.030014 | 66 | 44 | 28 | 15 | 38 | 57 |
| BÖTEBOR | Västra Götaland, | 1 628 | 0.198316 | 55 | 48 | 33 | 45 | 50 | 38 |
| BÖNKÖPIN | Västergötland, Jönköping, | 1260 | 0.112217 | 29 | 14 | 99 | 48 | 46 | 55 |
| SKÅN | Borlänge, Skåne, | 4862 | 0.178880 | 28 | 27 | 38 | 47 | 135 | 124 |
| E | Blåland, Uppsala, | 650 | 9 | 9 | 0 | 4 | 8 | 3 | 8 |
| STOCKHOL | Södermanland, | 2 870 | 0.312607 | 61 | 46 | 23 | 7 | 54 | 63 |
| M | Västergötland, | 654 | 7 | 4 | 8 | 1 | 0 | 5 | 9 |
| UME | Västernorrland, | 878 | 0.095675 | 124 | 110 | 86 | 57 | 36 | 10 |
| ÅSTERA | Västmanland, | 249 | 0.027136 | 759 | 237 | 21 | 47 | 41 | 61 |
| ÅXJ | Kronoberg, | 494 | 0.045151 | 24 | 23 | 22 | 52 | 27 | 41 |
| Ö | Kalmar | 9 682 | 3 | 1 | 0 | 7 | 1 | 1 | 8 |

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Table [A2.13: Calculation of estimated transport distance [(km)] (production to central depot)

| | Weighted distance | Weighted distance | Weighted distance | Weighted distance | Weighted distance | Weighted distance |
|------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| BORLÄNGE | Skåne 2 | Göteborg 1 | Östergötland 8 | Mälardalen 5 | Östersund 1 | Umeå 1 |
| GÖTEBOR | 0 | 3 | 4 | 9 | 13 | 10 |
| ÖNKÖPIN | 0 | 7 | 7 | 4 | 99 | 50 |
| SKÅN | 3 | 4 | 6 | 12 | 20 | 22 |
| E | 6 | 8 | 9 | 1 | 6 | 3 |
| STOCKHOL | 19 | 14 | 7 | 2 | 17 | 20 |
| M | 2 | 6 | 2 | 2 | 0 | 0 |
| UME | 11 | 10 | 8 | 5 | 3 | 1 |
| VÄSTERA | 91 | 51 | 36 | 52 | 5 | 0 |
| VÄXJ | 6 | 0 | 1 | 2 | 4 | 7 |
| Estimated | 47 | 36 | 30 | 36 | 70 | 70 |
| distance | 7 | 7 | 6 | 2 | 5 | 8 |

Appendix 3. Key data on transport chains

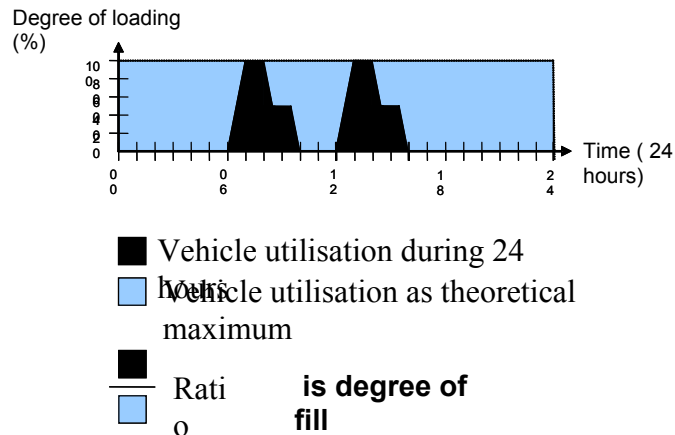
| Goods type | Range (kg) | W/pallet (kg) | Layers (high) | Pallets | Total wt (ton) | Capacity (ton) | Degree of loading wt | Fuel (l/km) | CO2 (g/km) | CO2 (g/km) | Degree of fill | CO2 (g/ton) | Thermo abs. CO2(g/ton) | Inta CO2 (g/ton) |
|--|-------------------------------|---------------|---------------|---------|----------------|----------------|----------------------|-------------|------------|------------|----------------|-------------|------------------------|------------------|
| Van in urban traffic 15 m | Light and high 150 to 350 | 250 | 1 | 5.5 | 1,375 | 1.5 | 0.9 | 0.1 | 31 | 230.5 | 5 | 46 | 138 | 6 |
| Small distribution lorry 18 pallet places | Light and low 150 to 350 | 250 | 1 | 8 | 4 | 5 | 0.9 | 0.2 | 86 | 146.7 | 5 | 29 | 8 | 4 |
| | Light and high 150 to 350 | 250 | 2 | 9 | 4 | 5 | 0.9 | 0.2 | 86 | 146.7 | 5 | 29 | 8 | 4 |
| | Medium and low 351 to 500 | 375 | 1 | 1 | 4 | 5 | 0.9 | 0.2 | 86 | 146.7 | 5 | 29 | 8 | 4 |
| | Medium and high 351 to 500 | 375 | 2 | 6 | 4 | 5 | 0.9 | 0.2 | 86 | 146.7 | 5 | 29 | 8 | 4 |
| | Heavy 501 to 800 | 750 | 1 | 6 | 4 | 5 | 0.9 | 0.2 | 86 | 146.7 | 5 | 29 | 8 | 4 |
| | Shared load 750 | 750 | 1 | 6 | 4 | 5 | 0.9 | 0.2 | 86 | 146.7 | 5 | 29 | 8 | 4 |
| | Shared load 750 | 750 | 1 | 6 | 4 | 5 | 0.9 | 0.2 | 86 | 146.7 | 5 | 29 | 8 | 4 |
| Large distribution lorry 21 pallet places | Light and low 150 to 350 | 250 | 1 | 2 | 5.2 | 10 | 0.5 | 0.3 | 97 | 186.2 | 5 | 37 | 112 | 5 |
| | Light and high 150 to 350 | 250 | 2 | 2 | 1 | 10 | 1.0 | 0.4 | 116 | 116.2 | 5 | 23 | 3 | 3 |
| | Medium and low 351 to 500 | 375 | 1 | 2 | 7.87 | 10 | 0.7 | 0.4 | 116 | 147.6 | 5 | 29 | 8 | 4 |
| | Medium and high 351 to 500 | 375 | 2 | 1 | 5 | 10 | 0.9 | 0.4 | 116 | 119.2 | 5 | 23 | 3 | 3 |
| | Heavy 501 to 800 | 750 | 1 | 3 | 5 | 10 | 0.9 | 0.4 | 116 | 119.2 | 5 | 23 | 3 | 3 |
| | Shared load 750 | 750 | 1 | 3 | 5 | 10 | 0.9 | 0.4 | 116 | 119.2 | 5 | 23 | 3 | 3 |
| | Shared load 750 | 750 | 1 | 3 | 5 | 10 | 0.9 | 0.4 | 116 | 119.2 | 5 | 23 | 3 | 3 |
| Int. artic. with trailer 33 pallet places | Light and low 150 to 350 | 250 | 1 | 3 | 8.2 | 2 | 0.3 | 0.3 | 793 | 86.0 | 6 | 16 | 4 | 2 |
| | Light and high 150 to 350 | 250 | 2 | 3 | 5 | 2 | 0.6 | 0.3 | 872 | 70.4 | 6 | 11 | 3 | 1 |
| | Medium and low 351 to 500 | 375 | 1 | 33 | 12.37 | 2 | 0.4 | 0.3 | 872 | 70.4 | 6 | 11 | 3 | 1 |
| | Medium and high 351 to 500 | 375 | 2 | 33 | 24.75 | 2 | 0.9 | 0.3 | 1030 | 41.6 | 6 | 2 | 1 | 0 |
| | Heavy 501 to 800 | 750 | 1 | 33 | 24.75 | 2 | 0.9 | 0.3 | 1030 | 41.6 | 6 | 2 | 1 | 0 |
| | Shared load 750 | 750 | 1 | 33 | 24.75 | 2 | 0.9 | 0.3 | 1030 | 41.6 | 6 | 2 | 1 | 0 |
| | Shared load 750 | 750 | 1 | 33 | 24.75 | 2 | 0.9 | 0.3 | 1030 | 41.6 | 6 | 2 | 1 | 0 |
| Bulk lorry for in-transport 50% urban traffic/minor roads 50% main roads | Heavy n/a | n/a | n/a | n/a | 4 | 4 | 1.0 | 0.4 | 1268 | 31.7 | 5 | 8 | 0 | 0 |
| | Light and low 150 to 350 | 250 | 1 | 48 | 1 | 4 | 0.3 | 0.3 | 1064 | 65.6 | 7 | 12 | 3 | 1 |
| | Light and high 150 to 350 | 250 | 2 | 48 | 2 | 4 | 0.6 | 0.4 | 1083 | 48.1 | 7 | 4 | 1 | 1 |
| | Medium and low 351 to 500 | 375 | 1 | 48 | 1 | 4 | 0.4 | 0.4 | 1083 | 60.1 | 7 | 8 | 2 | 1 |
| | Medium and high 351 to 500 | 375 | 2 | 48 | 3 | 4 | 0.9 | 0.4 | 1162 | 32.2 | 7 | 4 | 1 | 3 |
| | Heavy 501 to 800 | 750 | 1 | 48 | 4 | 4 | 0.9 | 0.4 | 1162 | 32.2 | 7 | 4 | 1 | 7 |
| | Shared load 750 | 750 | 1 | 48 | 3 | 4 | 0.9 | 0.4 | 1162 | 32.2 | 7 | 4 | 1 | 7 |
| Electric train with renewable electricity | 1000 ton | | | | | | | | | | 5 | 0.00 | 0.001 | 0.01 |
| Electric train EU-26 | 1000 ton | | | | | | | | | | 5 | 1 | 2 | 4 |
| Diesel train | 1000 ton | | | | | | | | | | 5 | 4 | 6.4 | 6 |
| Average train (83% elect/17% diesel) | 1000 ton | | | | | | | | | | 5 | 1 | 6 | 4 |
| Container vessel | 10000 TEU | | | | | | | | | | 1 | 1 | 4 | 4 |
| Feeder | 1100 TEU | | | | | | | | | | 6 | 0 | 4.8 | 2 |
| Ferr | 3000 lane | | | | | | | | | | 5 | 5 | 16 | 11 |
| Pass flight | 20'-112 ton | | | | | | | | | | 50 | 100 | 68 | 0 |
| Air freight | 20'-112 ton | | | | | | | | | | 50 | 100 | 68 | 0 |

Comments:

In the ongoing work to determine key data for the climate impact of various modes of transport, a number of issues have been resolved as regards the calculations. An initial and important question concerns the character of the goods – whether they are bulky and light or compact and heavy. In the case of voluminous goods, the load volume is the limiting factor, while the weight-bearing capacity of the vehicle is the limiting factor in the case of heavy goods. To take this into consideration, the goods have been classified as in section 9.1 according to their density in their transport packaging.

This gives slightly different calculation cases depending on the nature of the goods. For goods that are heavier by weight and goods in shared loads, it is assumed that the load is shared in such a way that the vehicle is utilised to the optimum. The column 'layers/high' refers either to goods on two pallets stacked on top of one another or goods that are already transported in high pallets that cannot be stacked. The ordinary height in that case is around 2 metres.

Degree of fill refers to the productivity that can be expected from the different modes of transport. This key parameter includes positioning etc. that causes the vehicle to not perform the transport task during the entire journey. See example in the diagram below.



Since a lorry with different weights of load has varying fuel consumption, this has been taken into consideration by having different fuel consumption figures for different loads. This consumption is based on interpolation between empty and full vehicle, where the value for the load by weight is the basis for the analysis. In supplements to this, fuel consumption is based on a weighed average between urban traffic and traffic on the main road network. This assumption is shown for the different types of vehicle.

Depending on the goods to be transported, temperature-controlled (thermo) transport may be required. This can include chilled, deep freeze and in some situations heated transport. The supporting values for these key data are shown in Appendix 1.

In addition to the direct climate impact of transport, the indirect effect from infrastructure is included. The supporting figures for these key data are shown in Appendix 6.

Appendix 4. Case studies

| TRANSPORT CHAIN FOR OUTDOOR TOMATOES FROM CANARY ISLANDS | | | | | | | | | |
|--|--------------------------------|---------------|-----------------|-----------------------------|---------------|---|-----------------------------------|----|--|
| Spain tomato farm, Gran Canaria, Spain | | | | | | | | | |
| Descriptio | Vehicle | Distance (km) | Mass flow (ton) | g CO ₂ -eq./t·km | Thermo suppl. | Supplement for infrastructure and vehicle | g CO ₂ -eq./kg product | | |
| Lorry transport from grower to port | Large distribution lorry | 3 | 0.00 | 23 | 7 | 3 | 1 | | |
| Boat transport Las Palmas-Rotterdam | Container vessel | 325 | 0.00 | 81 | 24 | 62 | 8 | | |
| Port transport Rotterdam-Helsingborg | Int. artic. lorry with trailer | 092 | 0.00 | 6 | 2 | 1 | 0 | | |
| General estimated aver. transp from central depot - all central depots in Sweden | Swedish long-dist lorry | 48 | 0.00 | 4 | 1 | 7 | 3 | | |
| General estimated aver. transp from central depot - supermarket Sweden | Swedish long-dist lorry | 6 | 0.00 | 4 | 1 | 7 | 4 | | |
| Sweden | (70%) | 0 | 1 | 6 | 4 | | | 19 | |
| | | | | | | | | 2 | |

| TRANSPORT CHAIN FOR GREENHOUSE TOMATOES FROM THE NETHERLANDS | | | | | | | | | |
|--|--------------------------|---------------|-----------------|-----------------------------|---------------|---|-----------------------------------|----|--|
| Netherlands tomato farms outside Rotterdam | | | | | | | | | |
| Descriptio | Vehicle | Distance (km) | Mass flow (ton) | g CO ₂ -eq./t·km | Thermo suppl. | Supplement for infrastructure and vehicle | g CO ₂ -eq./kg product | | |
| Lorry transport from grower (Rotterdam) | Int. artic. with trailer | 92 | 0,00 | 6 | 2 | 1 | 9 | | |
| General estimated aver. transp. from central depot Skåne - all central depots Sweden | Swedish long-dist. lorry | 48 | 0,00 | 4 | 1 | 7 | 3 | | |
| General estimated aver. transp. from central depot Sweden - Supermarket | Swedish long-dist. lorry | 6 | 0,00 | 4 | 1 | 7 | 4 | | |
| Sweden | (70%) | 0 | 1 | 6 | 4 | | | 12 | |
| | | | | | | | | 8 | |

| TRANSPORT CHAIN FOR FRENCH APPLES | | | | | | | |
|--|--------------------------------|---------------|-----------------|---|---------------|-----------------------------------|-----------------------------------|
| Description | Vehicle | Distance (km) | Mass flow (ton) | g CO ₂ -eq./tonkm ²⁹³ (Volume 293 kg/m ³) | Thermo suppl. | Suppl. for infrastructure vehicle | g CO ₂ -eq./kg product |
| Lorry transport grower in Toulouse France to depot in Besenget | Int. artic. with trailer (60%) | 199 | 0,00 | 6 | 2 | 1 | 19 |
| General estimated aver. transport depot Skåne – all depots in Sweden | Swedish long-dist. lorry (70%) | 0 | 1 | 9 | 1 | 0 | 9 |
| General estimated aver. transport depot in Sweden supermarket | Swedish long-dist. lorry (70%) | 0 | 1 | 6 | 4 | 7 | 2 |
| Sweden | | 0 | 1 | 6 | 4 | 7 | 4 |
| | | | | | | | 23 |

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| TRANSPORT CHAIN FOR SWEDISH APPLES FROM KIVIK | | | | | | | |
|--|-------------------------------|--------------|-----------------|---|---------------|-----------------------------------|-----------------------------------|
| Description | Vehicle | Distance(km) | Mass flow (ton) | g CO ₂ -eq./tonkm ²⁹³ (Volume 293 kg/m ³) | Thermo suppl. | Suppl. for infrastructure vehicle | g CO ₂ -eq./kg product |
| Lorry transport from grower Kivik to depot in Helsingborg | Swedish long-dist.lorry (70%) | 13 | 0,00 | 4 | 1 | 7 | 9 |
| General estimated aver. transport from central depot in Skåne central depots in Sweden | Swedish long-dist.lorry (70%) | 0 | 1 | 6 | 4 | | |
| General estimated aver. transport from central depot Sweden supermarket | Swedish long-dist.lorry (70%) | 0 | 1 | 6 | 4 | 7 | 3 |
| Sweden | | 0 | 1 | 6 | 4 | 7 | 4 |

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| TRANSPORT CHAIN FOR CHILEAN APPLES | | | | | | | |
|--|--------------------------|---------------|-----------------|------------------------------|---------------|----------------------------------|-------------------------------|
| Descriptio | Vehicle | Distance (km) | Mass flow (ton) | g CO ₂ -eq/ton km | Thermo suppl. | Suppl. infrastructur and vehicle | g CO ₂ -eq product |
| Lorry transport from grower Curico (Chile) – port | Large distribution lorry | 18 | 0,00 | 23 | 7 | 3 | 6 |
| Antonio San | (50%) | 0 | 1 | 8 | 2 | 6 | 2 |
| Boat transport San Antonio | Container vessel | 1386 | 0,00 | 1 | 4 | 2 | 22 |
| Rotterdam | (60%) | 0 | 1 | 0 | | | 2 |
| Boat transport Rotterdam | Feeder | 108 | 0,00 | 1 | 4 | 2 | 2 |
| Rotterdam | (60%) | 0 | 1 | 2 | 8 | 4 | 1 |
| From port to depot | Large distribution lorry | 1 | 0,00 | 23 | 7 | 3 | 5 |
| General estimated av. from central depot | | 5 | 1 | 8 | 2 | 6 | |
| Skåne-all central depots | | | | | | | |
| Sweden | Swedish long-dist.lorry | 48 | 0,00 | 4 | 1 | 7 | 3 |
| General estimated av. from central depot in Sweden | (70%) | 0 | 1 | 6 | 4 | | 2 |
| Supermarket | Swedish long-dist.lorry | 6 | 0,00 | 4 | 1 | 7 | 4 |
| Sweden | (70%) | 0 | 1 | 6 | 4 | | 34 |

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| TRANSPORT CHAIN FOR SPANISH ROCKET IN PLASTIC TRAY | | | | | | | |
|--|--------------------------|------------|-----------------|---|---------------|---------------------------------------|-------------------------------|
| Descriptio | Vehicle | Dist. (km) | Mass flow (ton) | g CO ₂ -eq/ton km ²⁰ (kg/m ³) | Thermo suppl. | Suppl. for infrastructure and vehicle | g CO ₂ -eq product |
| Lorry transport from grower in Valencia - intermediate depot | Large distribution lorry | 3 | 0,001 | 23 | 7 | 3 | 1 |
| Lorry transport Valencia (50%) | Int. artic. with trailer | 0 | 1 | 2 | 0 | 5 | 1 |
| Central depot Helsingborg (60%) | Int. artic. with trailer | 258 | 0,001 | 8 | 2 | 1 | 36 |
| General estimated av. transp from Central Skåne-all central depots in Sweden (70%) | Swedish long-dist.lorry | 0 | 1 | 8 | 6 | 3 | 0 |
| Sweden - supermarket | Swedish long-dist.lorry | 48 | 0,001 | 4 | 1 | 7 | 3 |
| Sweden - supermarket | Swedish long-dist.lorry | 0 | 1 | 6 | 4 | | 5 |
| Sweden - supermarket | Swedish long-dist.lorry | 6 | 0,001 | 4 | 1 | 7 | 4 |
| Sweden | (70%) | 0 | 1 | 6 | 4 | | 41 |

1

150 g rocket in 15 g plastic trays gives mass flow 0.0011 (1 kg product + 100 g packaging)

| TRANSPORT CHAIN FOR BRAZILIAN ORANGES | | | | | | | |
|--|--------------------------------|------------|-----------------|---|------------------|--|---------------------------------------|
| Description | Vehicle | Dist. (km) | Mass flow (ton) | g CO ₂ - equivalent per ton kg/m ³ | Thermo suppl. | Suppl. infrastructure and vehicle | g CO ₂ - eq/ product |
| Lorry transport Sao Paulo – port in Santos | Large distribution lorry (50%) | 8 | 0,00 | 23 | 7 | 3 | 2 |
| Boat transport Santos | Container vessel (60%) | 1005 | 0,00 | 1 | 4 | 2 | 16 |
| Boat transport Retenon | Feeder (60%) | 108 | 0,00 | 1 | 5 | 2 | 2 |
| From port to depot | Large distribution lorry (50%) | 1 | 0,00 | 23 | 7 | 3 | 5 |
| General estimated av. transp from central depot - all central depots in Sweden | Swedish long-dist.lorry (70%) | 48 | 0,00 | 4 | 1 | 7 | 3 |
| General estimated av. transp from central depot Sweden | Swedish long-dist.lorry (70%) | 0 | 1 | 6 | 4 | | 2 |
| supermarket Sweden | Swedish long-dist.lorry (70%) | 6 | 0,00 | 4 | 1 | 7 | 4 |
| | | 0 | 1 | 6 | 4 | | 25 |

2

| TRANSPORT CHAIN FOR NORWEGIAN SALMON 4 x140 g IN PLASTIC PACKAGING | | | | | | | |
|---|--------------------------------|------------|----------------------------|--|---------------|----------------------------------|-------------------------------|
| Description | Vehicle | Dist. (km) | Mass flow (ton) allocation | g CO ₂ -equiv./ton brass. kg/m ³ | Thermo suppl. | Suppl. infrastructur and vehicle | g CO ₂ -kg/product |
| Transp from port – to factory | Large distribution lorry | 1 | 0,0018 | 23 | 7 | 3 | 9 |
| Transp from factory to fillet processing | (50%) Large distribution lorry | 5 | 5 | 2 | 0 | 5 | |
| Hestevika from Hestevika to industrial | (50%) Int. artic. with trailer | 3 | 0,0015 | 23 | 7 | 3 | 1 |
| Helsingborg | (60%) Helsingborg | 0 | 4 | 2 | 0 | 5 | 6 |
| General estimated av. transp from central depot | (60%) Int. artic. with trailer | 100 | 0,0010 | 8 | 2 | 1 | 13 |
| Skåne-all central depots in Sweden | (60%) Swedish long-dist.lorry | 0 | 4 | 8 | 6 | 3 | 2 |
| General estimated av. transp from central depot in Sweden - supermarket | (70%) Swedish long-dist.lorry | 48 | 0,0010 | 4 | 1 | 7 | 3 |
| Sweden | (70%) Swedish long-dist.lorry | 0 | 4 | 6 | 4 | | 3 |
| | | 6 | 0,0010 | 4 | 1 | 7 | 4 |
| | | 0 | 4 | 6 | 4 | | 19 |

5

| TRANSPORT CHAIN FOR PACK COD FROM BARENTS | | | | | | | |
|---|--------------------------|------------|----------------------------|---|---------------|---------------------------------------|-------------------------------|
| SEA | | | | | | | |
| Description | Vehicle | Dist. (km) | Mass flow (ton) allocation | g CO ₂ -eq/ton km ³ | Thermo suppl. | Suppl. for infrastructure and vehicle | g CO ₂ -eq/product |
| Transp from processing plant (Step 1) for incoming fish) | | | | | | | |
| Industrial depot in Helsinki | Int. artic. with trailer | 196 | 0,0010 | 6 | 2 | 1 | 20 |
| Fishing port across | (70%)(50) | 8 4 | 5,0010 | 9 | 1 | 0 | 7 4 |
| General estimated av. transp from central depot | (%) | 8 | 5 | 6 | 7 | 1 | |
| Step 2-all central depots in Sweden | Swedish long-dist.lorry | 48 | 0,0010 | 4 | 1 | 7 | 3 |
| General estimated av. transp from central depot in Sweden | (70%) | 0 | 5 | 6 | 4 | | 4 |
| Supermarket Sweden | Swedish long-dist.lorry | 6 | 0,0010 | 4 | 1 | 7 | 4 |
| Sweden | (70%) | 0 | 5 | 6 | 4 | | 24 |

400 g cod plus 19 g carton

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Fish trimmed on

Processing plant in fishing port (no transp)

| TRANSPORT CHAIN FOR SWEDISH WHEAT | | | | | | | |
|--|-------------------------|------------|----------------------------|---|---------------|---------------------------------------|-------------------------------|
| FLOUR | | | | | | | |
| Description | Vehicle | Dist. (km) | Mass flow (ton) allocation | g CO ₂ -eq/ton km ³ | Thermo suppl. | Suppl. for infrastructure and vehicle | g CO ₂ -eq/product |
| General transp wheat to mill in Uppsala | Swedish bulk lorry | 15 | 0,0011 | 6 | 1 | 1 | 1 |
| General estimated av. transp from Uppsala-all central depots in Sweden | (70%)(return) | 0 | 7 | 3 | 0 | 3 | |
| General transp from central depot Sweden | Swedish long-dist.lorry | 36 | 0,00100 | 4 | 7 | 1 | |
| General estimated av. transp from central depot Sweden | (70%) | 2 | 2 | 6 | | 9 | |
| Supermarket Sweden | Swedish long-dist.lorry | 6 | 0,00100 | 4 | 7 | 3 | |
| Sweden | (70%) | 0 | 2 | 6 | | 3 | |

5

| TRANSPORT CHAIN FOR CHEESE FROM VÄSTERBOTTEN | | | | | | | |
|---|---------------------------------|------------|-----------------|---------------------------------|---------------|----------------------------------|-------------------------------|
| Descriptio | Vehicle | Dist. (km) | Mass flow (ton) | g CO ₂ -equiv/ton-km | Thermo suppl. | Infrastructur and Suppl. vehicle | g CO ₂ -kg/product |
| Lorry transp of raw milk to dairy Burträsk | Swedish bulk (50% empty return) | 15 | allocation | 0,0 | 6 | 1 | 13 |
| General estimated av. transp. Västerbotten | | 0 | | 1 | 3 | 9 | 8 |
| Umeå-all central depots in Sweden | Swedish long-dist.lorry (70%) | 79 | 0,00100 | 100 | 4 | 1 | 5 |
| General estimated av. transp. from central depot Sweden - supermarket | Swedish long-dist.lorry (70%) | 6 | 0,00100 | 100 | 4 | 1 | 4 |
| | | 0 | | 8 | 6 | 4 | 19 |

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| TRANSPORT CHAIN FOR SWEDISH CARROTS FROM GOTLAND | | | | | | | |
|--|--------------------------------|------------|-----------------|---------------------------------|---------------|----------------------------------|-------------------------------|
| Descriptio | Vehicle | Dist. (km) | Mass flow (ton) | g CO ₂ -equiv/ton-km | Thermo suppl. | Infrastructur and Suppl. vehicle | g CO ₂ -kg/product |
| Transp. grower - Pack-packer to | Large distribution lorry (50%) | 2 | 0,0012 | 23 | 7 | 3 | 9 |
| Ferry Visby-Nynäshamn | (50%) | 14 | 0,00100 | 85 | 2 | 6 | 1 |
| General estimated av. transp Nynäshamn, 70% Stockholm, 30% | Swedish long-dist.lorry (70%) | 9 | 0,00100 | 100 | 4 | 1 | 6 |
| General estimated av. transp from central depot Sweden - supermarket | Swedish long-dist.lorry (70%) | 6 | 0,00100 | 100 | 4 | 1 | 4 |
| | | 0 | | 5 | 6 | 4 | 3 |

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Appendix 5. HDI 2009

