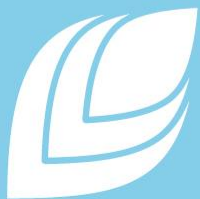


Economic, soil health and environmental impacts of use of biobased fertilizers at farm level in the EU

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Content

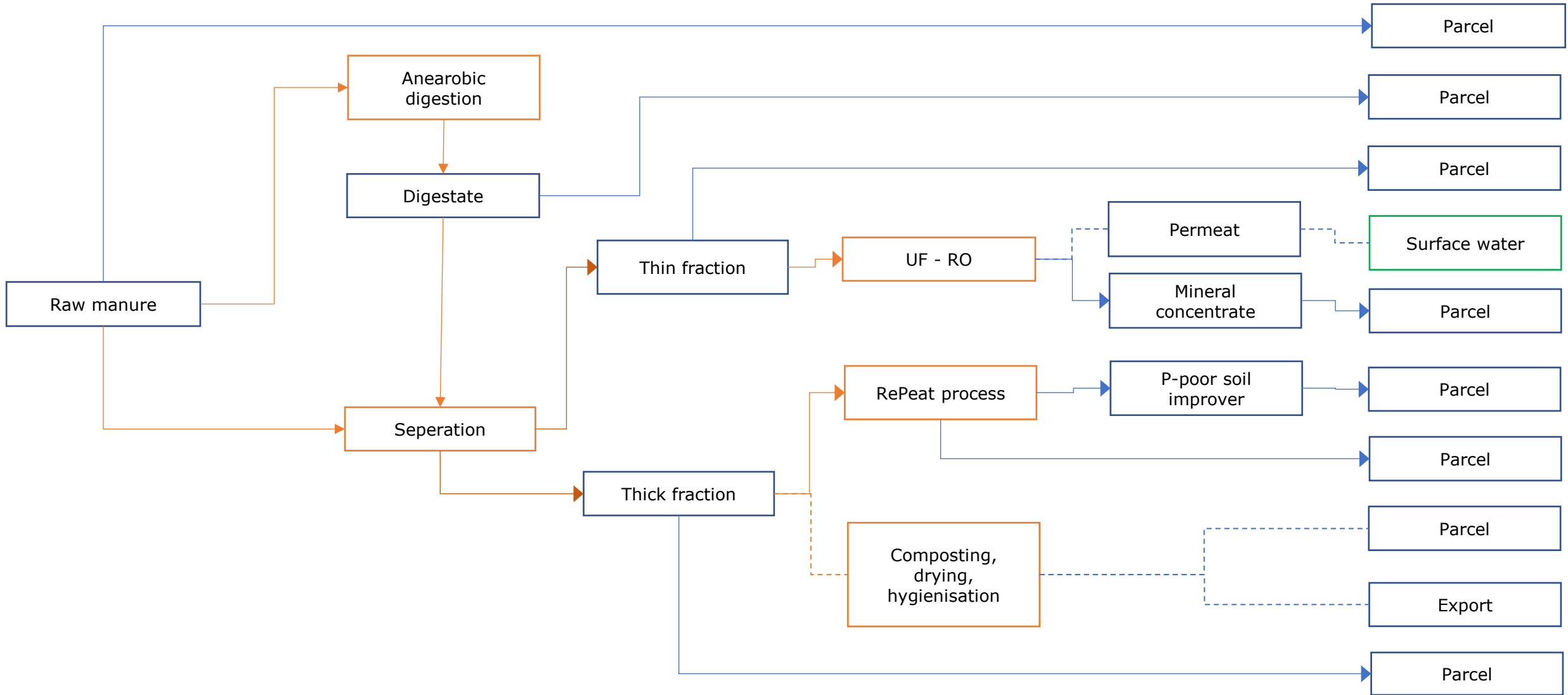
- Farmdyn Biocash
 - Model extension
 - Biobased Fertilizers
- Farmdyn Application
 - Farm sample data
 - Farm samples
- Baseline fast track results
 - Farm characteristics
 - Effective organic matter supply
 - Fertilizer application
 - Nutrient flows
- Proposed scenarios

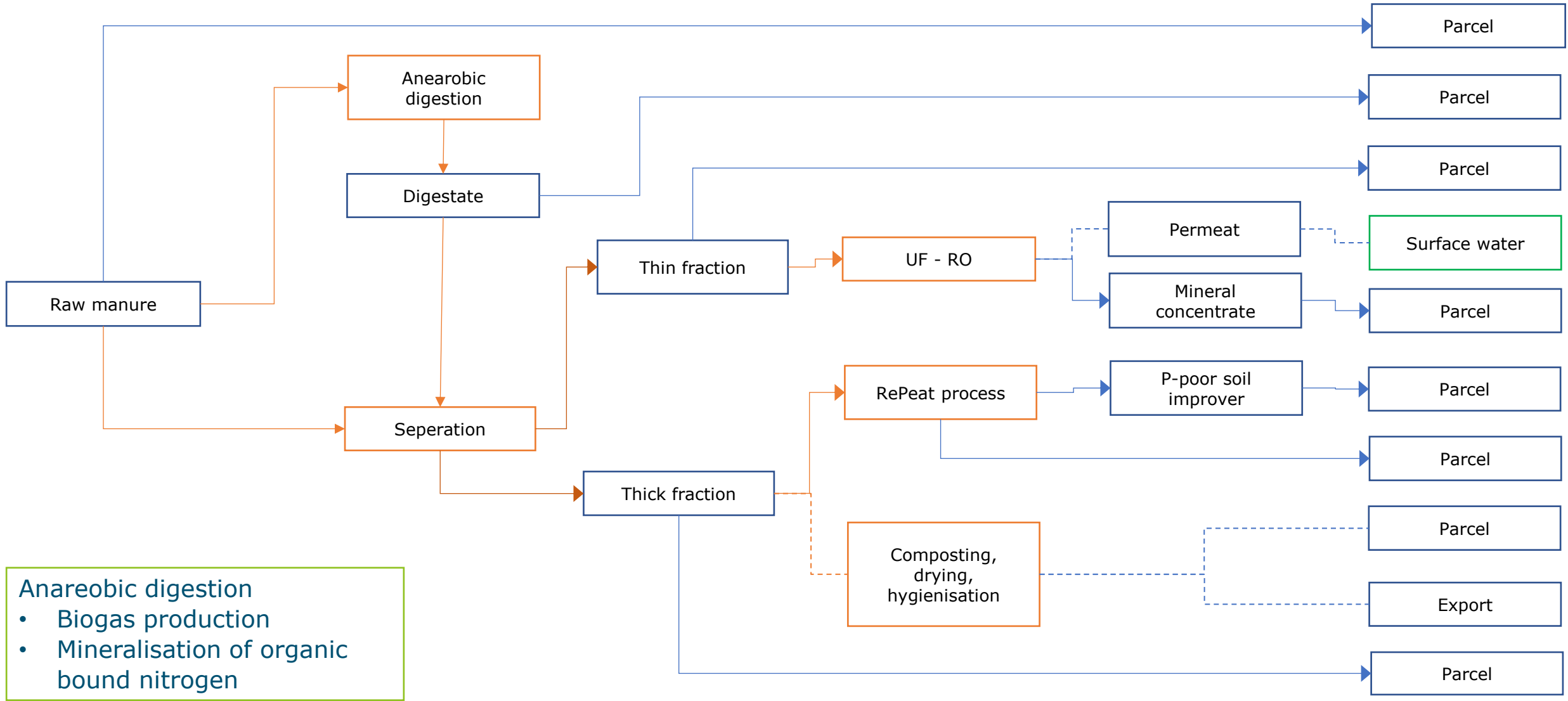
Farmdyn Biocash: Model extension

- Extending available manure types
 - Identified different manure products and characteristics
 - Linking manure products to application types and agronomic limitations
 - Implement regional specific manure application constraints

Biobased fertilizers

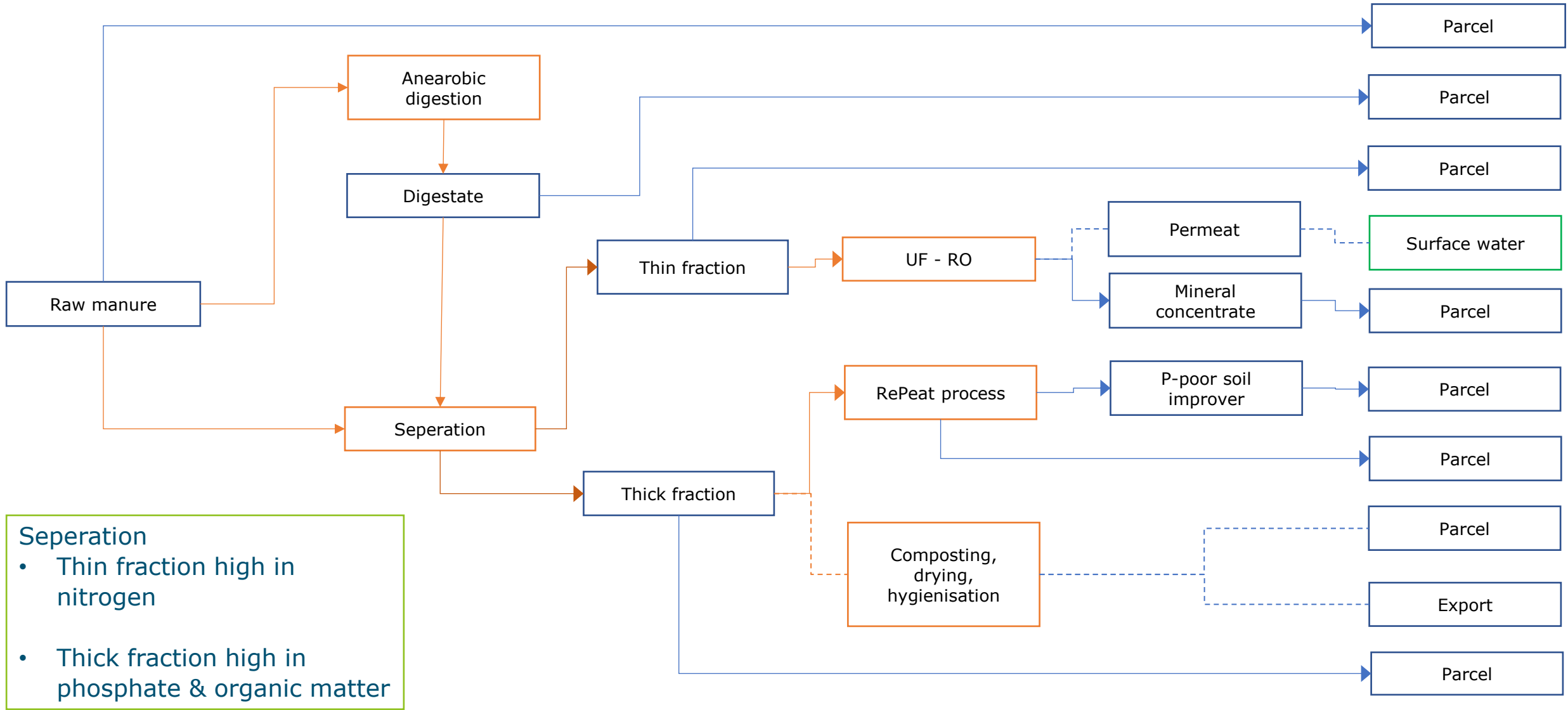
Category	Bio-based fertilizers	EOM (kg/ton)	Ntot (kg/ton)	Nmin (kg/ton)	Norg (kg/ton) Ratio	P (P2O5)
Slurry import	Cattle slurry untreated	50	4.0	2.1	1.9	1.5
	Pig slurry untreated	26	7.0	3.3	3.7	3.9
	Cattle slurry digestate	42	4.0	1.6	2.4	1.5
	Pig Slurry digestate	24	7.0	2.5	4.5	3.9
Solid Import	Cattle solid	109	7.7	6.6	1.1	4.3
	Pig solid	50	7.9	5.3	2.6	7.9
	Poultry solid	130	32.7	28.9	3.8	25.6
	Thick fraction cattle slurry	135	7.3	5.7	1.6	4.1
	Thick fraction pig slurry	61	10.8	7.7	3.1	9.1
Liquid import	Liquid fraction cattle slurry digestate	28	4.2	1.8	2.4	1.3
	Liquid fraction cattle slurry	25	3.1	1.1	2.0	0.8
	Liquid fraction pig slurry digestate	5	4.7	1.2	3.5	0.4
	Liquid fraction pig slurry	14	5.7	1.8	3.9	2.1
Compost import	Green compost	238	7.8	7.0	0.8	4.1
	GFT compost	290	11.8	10.6	1.2	6.4
Renure import	Mineral concentrate	3	6.3	1.0	5.3	0.2





Anareobic digestion

- Biogas production
- Mineralisation of organic bound nitrogen



Seperation

- Thin fraction high in nitrogen
- Thick fraction high in phosphate & organic matter

Farmdyn Biocash: Biobased Fertilizers for arable farmers

Category	Bio-based fertilizers	EOM (kg/ton)	Ntot (kg/ton)	Nmin % Share	Nmin/P Ratio
Compost import	Green compost	238	7.8	10%	0.20
Solid Import	Thick fraction cattle slurry	135	7.3	22%	0.39
Slurry import	Cattle slurry	50	4.0	48%	1.27
Liquid import	Liquid fraction cattle slurry	25	3.1	65%	2.50
Renure import	Mineral concentrate	3	6.3	84%	26.50

Farmdyn Application: Farm sample data

- Default data
 - Output and input prices
 - Nutrient content of crop (kg per kg output)
 - Nutrient need/N-response curve
 - Machinery need Lifetime of the machines Machinery prices
- Regional specific data from FADN (Farm Accountancy Data Network)
 - Crop yields (ton per ha per crop)
 - Maximum share of crops in rotation (ha)
 - Net value added per farm in base (euro per farm)
- Regional specific data from CAPRI
 - Crop nutrient need
 - Availability of manure
 - Maximum manure application (N / ha)

Farmdyn Application: Farm sample

- Average Regional arable farm from FADN selection
- FADN data and selection
 - Specialist Cereals, Oilseed and Protein crops
 - General Field cropping
 - Specialized horticulture
 - 80 % of cropping plan should be covered by Farmdyn included crops
- Three regions for fasttrack results:

	DE94 Neutral Region	NL11 Exporting Region	SK02 Importing Region
Biobased fertilizer products	Compost and manure products excluding liquid fraction and Renure	All products	Compost and untreated manure
Biobased fertilizer Prices	Market Price	Market Price	Fertilizer Replacement Value

Farmdyn base results : Farm Characteristics

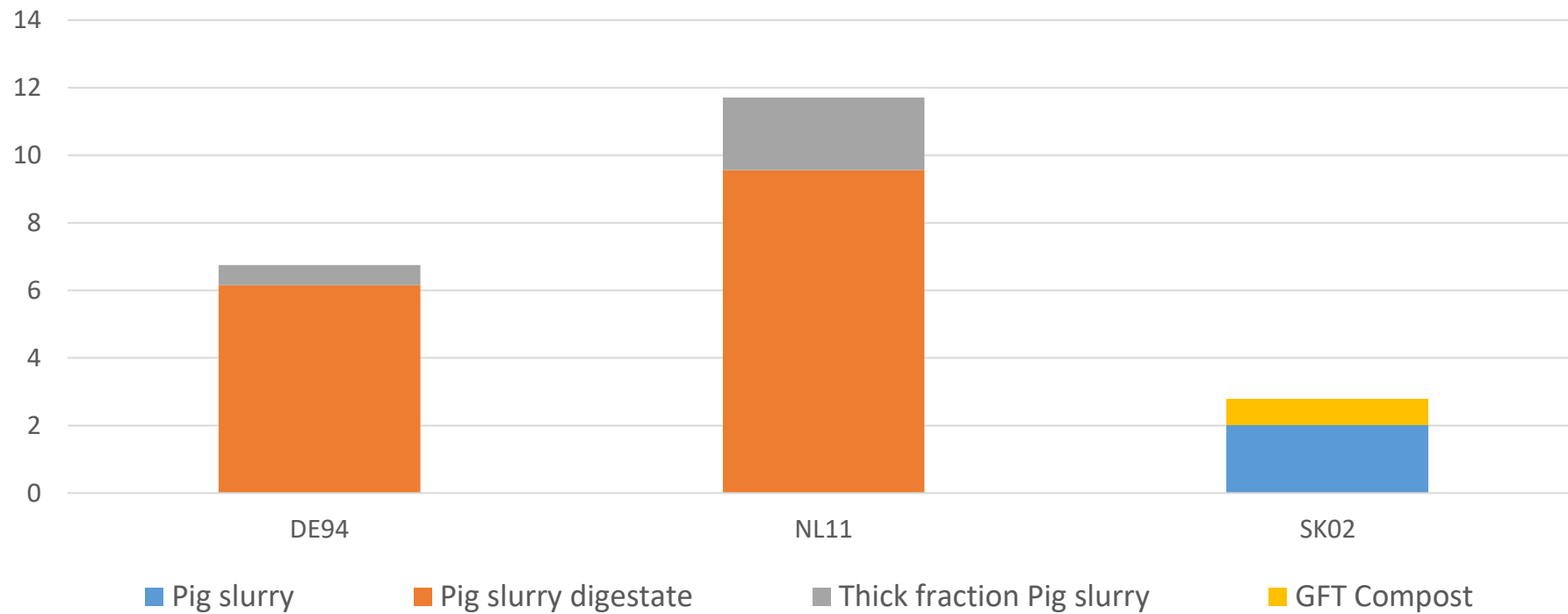
		DE94	NL11	SK02
Farm Net Value Added	<i>Euros</i>	€ 81,146	€ 122,404	€ 149,448
Total land	<i>Ha</i>	64.0	75.6	257.4
WinterWheat		42.6	40.5	143.6
WinterBarley		9.3		
WinterRape		0.0	2.2	42.1
SummerCere		4.9	0.3	4.4
Potatoes		6.0	18.8	0.0
Sugarbeet		1.1	13.5	11.2
MaizCorn		0.0	0.3	56.2
Total area		64.0	75.6	257.4

Farmdyn base results : Organic matter supply

		DE94	NL11	SK02
Total organic matter supply	<i>KG EOS / ha</i>	1731	1717	1839
Source	Crop	1547	1356	1567
	Straw	0	0	0
	Manure	184	361	272

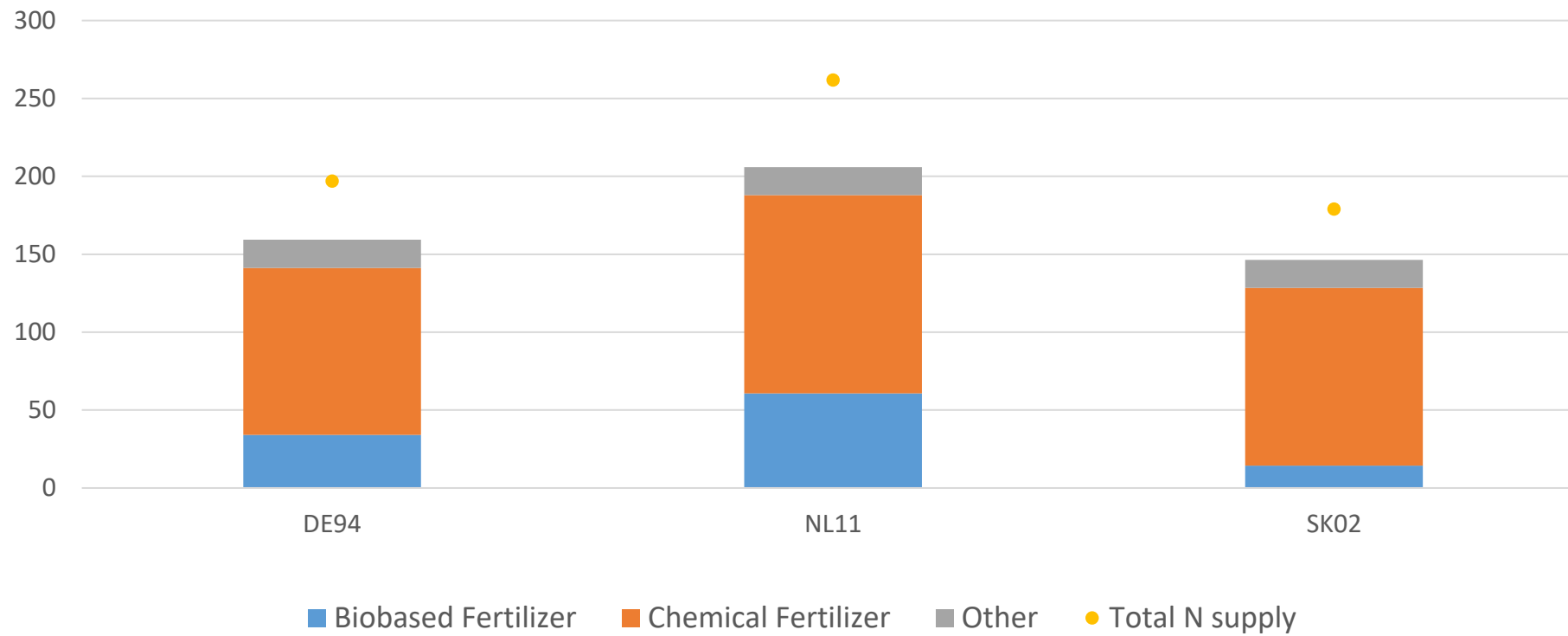
Farmdyn Base results : Fertilizer application

Manure Applied in Ton / Ha



Farmdyn Base results : Fertilizer application

Crop Available N supply



Farmdyn Base results : Nutrient flows

		DE94	NL11	SK02
Total nitrogen use	<i>KG / N / Ha</i>	197	262	179
Source	Biobased Fertilizers	50	90	23
	Chemical fertilizer	129	154	138
	Other	18	18	18
Crop Available nitrogen supply	<i>KG / N / Ha</i>	159	206	146
Source	Biobased Fertilizer	34	61	14
	Chemical fertilizer	107	127	114
	Other	18	18	18

Biocash Proposed Scenarios

- Straw left on land
- Mandatory covercrops
- Minimum requirement of 20 % phosphate from compost
- Winterwheat instead of sugarbeets
- Subsidy on carbon sequestration
- Tax on Nitrogen from chemical fertilizer
- Tax on Nitrogen surplus