SMARTER

SMAll RuminanTs breeding for Efficiency and Resilience

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Paper on economic, labour and environmental tradeoffs for breeding for R&E traits

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About the SMARTER research project

SMARTER will develop and deploy innovative strategies to improve Resilience and Efficiency (R&E) related traits in sheep and goats. SMARTER will find these strategies by: i) generating and validating novel R&E related traits at a phenotypic and genetic level ii) improving and developing new genome-based solutions and tools relevant for the data structure and size of small ruminant populations, iii) establishing new breeding and selection strategies for various breeds and environments that consider R&E traits.

SMARTER with help from stakeholders chose several key R&E traits including feed efficiency, health (resistance to disease, survival) and welfare. Experimental populations will be used to identify and dissect new predictors of these R&E traits and the trade-off between animal ability to overcome external challenges. SMARTER will estimate the underlying genetic and genomic variability governing these R&E related traits. This variability will be related to performance in different environments including genotype-by-environment interactions (conventional, agro-ecological and organic systems) in commercial populations. The outcome will be accurate genomic predictions for R&E traits in different environments across different breeds and populations. SMARTER will also create a new cooperative European and international initiative that will use genomic selection across countries. This initiative will make selection for R&E traits faster and more efficient. SMARTER will also characterize the phenotype and genome of traditional and underutilized breeds. Finally, SMARTER will propose new breeding strategies that utilise R&E traits and trade-offs and balance economic, social and environmental challenges.

The overall impact of the multi-actor SMARTER project will be ready-to-use effective and efficient tools to make small ruminant production resilient through improved profitability and efficiency.

Contents

1 Summary

In this study, a farm-scale mathematical programming model for sheep and goat farms is proposed to simulate economic performance, including new resilience sheep traits that allow animals to counteract the presence of infectious and non-infectious diseases. The model was developed in the Small Ruminants Breeding for Efficiency and Resilience (SMARTER; www.smarterproject.eu) Horizon 2020 project. The SMARTER model is a comprehensive and adaptable linear program-ming model that enables the assessment of hypothetical scenarios/challenges related to animal traits that prevent infectious and non-infectious diseases. The optimal performance and the structure of the farm is modeled under the presence of infectious and non-infectious diseases (disease plan), and under conditions where no diseases occur (future plan). A comparison of the model solutions, between presence and absence of diseases, provides suggested adjustments to the farming system and insights into the potential shape of new sustainable farm system profiles for the sheep and goat sector. Technical and economic data from five different sheep farms and one goat farm in Greece and France were used in this empirical application to assess different scenarios in the presence of mastitis, parasitism and lameness in the flocks. The results showed that the profitability and sustainability of the farms is significantly improved when the resilience of animals reduces the impact of the diseases. However, this does not affect the production and management plan of the farmer and does not alter the structural profile of the farm the rears healthy animals.

2 Introduction

Small ruminant farms operate in a challenging and competitive environment, and efforts to intensify production threatens the multidimensional nature of these farms, which is a key characteristic of their resilience [1, 2, 3, 4]. Resilience is subject of debate when considering genetic trade-offs between traits such as growth, milk production, prolificacy, or fertility and resistance or tolerance to diseases [5, 6, 7]. Animal diseases reduce productivity, economic performance and in some cases survival of livestock, constituting a significant constraint to the sustainability and profitability of small ruminant production [8, 9]. The notion is that the development of new traits that increase resistance or tolerance to infectious and non-infectious diseases improves the sustainability of sheep and goat farms and allows for more efficient management of such farming systems [8, 10, 11, 12].

Previous research on the impact of new traits that counteract the presence of diseases on the economic and environmental sustainability of small ruminant farms indicate that the potential benefits for the performance of the farms under these new traits are significant [13, 14, 15, 16, 17, 18]. The findings of the studies show that resistance to diseases will reduce expenses on veterinary services and treatment costs, reduce labor use for checking and treating animals in the flock, increase productivity and, hence, farm revenues. Resistance to diseases has also been shown to enhance animal welfare and reduce environ-mental impact through the reduced use of drugs and chemicals, improving in the long term the overall sustainability of the small ruminant sector. However, there is limited literature that explicitly models the overall performance of a whole livestock farm under challenges that are related to animal diseases. An extensive review of studies that investigate the economic impact of diseases in sheep flocks can be found in Whatford et al. [19].

In this study, a farm-scale mathematical programming model for sheep and goat farms is proposed to simulate economic performance, including new resilience sheep traits that allow animals to counteract the presence of infectious and non-infectious diseases. The model provides scenarios demonstrating how changes to optimize one farm component (e.g., farm indicators that are directly affected by genetics at animal level) could affect other components of the farm or the overall system (e.g. gross margin, labor, land use, grazing, profit etc.), in terms of sustainability. The idea is to develop a comprehensive and flexible farm-scale model, applicable to various production systems, environments, and breeds, that can be used by policymakers to identify problems and propose innovative strategies to re-design small ruminant farming systems. This adaptable linear programming (LP) model allows for the simulation of farm operations under different environmental, economic, and managerial challenges. In this case-study the LP model is used to estimate the performance and resilience trajectories of farms under infectious and non-infectious diseases, and to describe the adjustments that will occur in the farm and the relative production system, and therefore implicitly reveal the benefits of the new efficiency and resilience traits.

The model is applied using primary technical and economic data from typical sheep and goat farms in Greece and France that rear different breeds and operate under diverse production systems. In total, six different breeds, five sheep breeds (Chios, Assaf, Lacaune, Frizarta, Boutsko) and one goat breed (Skopelos), were simulated using the LP model and the impact of mastitis, gastro-intestinal nematode (GIN) parasites and lameness on farm structure and profitability was assessed. Two alternative scenarios were examined; in the first scenario, the farm's performance is modeled under the presence of mastitis, GIN parasites and lameness (disease plan), while in the second scenario the model simulates farm's performance under perfect conditions where no diseases occur (future plan). The solution indicates suggested adjustments to the farming system and provides insights in-to the potential shape of new sustainable farm system profiles for the sheep and goat sector.

3 Materials and Methods

3.1 Methodological approach

Linear Programming is a mathematical procedure for optimum resource allocation. Linear Programming maximizes or minimizes a linear function of variables (objective function) that are subject to linear inequalities (constraints) and must assume non-negative levels [20, 21, 22, 23]. The algebraic expression of a LP problem is:

max (min) $$\sum_{j=1}^{M} c_j x_j = Z \quad (1)$$

$$\sum_{j=1}^{M} a_{ij} x_j \leq A_i \quad (2)$$

$$x_j \geq 0 \quad (3)$$

where:

Z: the objective function, which is maximized in the optimization problem, denotes the Gross Margin (GM) (revenues less variable cost) achieved by a typical farm.

x_j: the M activities of the farm (milk production, lamb and ewe meat production, on-farm cheese production, crop cultivation for feedstuff, grazing, purchasing feed etc).

c_j: the contribution of each activity x_j to the objective function (GM).

a_{ij}: the requirements per unit of x_j, where its available resource is A_i.

The solution produces an optimum combination of activities for output maximization. It is worth noting that this model can also be converted to a parametric programming model, in which, the available resources (A_i) of a certain input or the gross margin (c_j), vary within an acceptable price range, yielding a set of alternative optimal plans.

The method has been applied in the livestock sector for numerous research purposes. Sintori et al. [24] used a mathematical programming model to simultaneously assess the socio-economic and environmental performance of sheep farms in Greece. In the dairy cow sector, Theodoridis et al. [25] used a mathematical programming model to assess the impact of farm policies, while Ragkos et al. [26] applied a LP model to assess the financial viability operating an automated management system for mussel farms. Ragkos et al. [27], also applied a parametric mathematical model to assess different feeding strategies in dairy cattle sector in Greece. In the sheep sector, recent applications of the method include the work of Almeida et al. [28], who studied the optimal structure of sheep production relative to the use of pastures and of Wall et al. [29], who used a linear programming model to assess the effects of innovations in reproduction management in sheep flocks. Olaizola et al. [30] used a mixed programming approach to assess the adaptation strategies for sheep-crop mixed systems in Spain. In Greece, relevant examples include the study by Sintori et al. [31].

The model in this study was developed within the Small Ruminants Breeding for Efficiency and Resilience (SMARTER) Horizon 2020 project (https://www.smarterproject.eu/). This SMARTER LP model simulates the main interactions between the animal, management, prices, yields and local conditions at the farm level and can assess the overall sustainability of farm types (production systems) under various scenarios. The basic idea behind the SMARTER LP model is to simulate the actual operation of a farm through the maximization of its economic performance. As the model integrates all aspects of the operation of a sheep and goat farm, it allows us to predict the impact of changes in one component on the others. With this design, the SMARTER LP model allows the examination of scenarios that accommodate the presence or absence of infectious and non-infectious diseases in a flock.

The generic LP model matrix is presented in Table 1, while the whole executable code (Linear Programming Matrix in sparse "long" format) of the SMARTER model for the exemplary case of Chios sheep breed is presented in Spreadsheet S1. The optimization part of the model, which is explained below, involves the optimization of economic performance, which is defined as the gross margin achieved by the farm, subject to a set of economic and physical constraints. The solution includes the number of sheep carried under the maximum economic performance of the farm. The gross margin in the objective function is expressed analytically and all its components are expressed separately. These are:

- Revenues: Milk (yield*price); Meat (yield*price); Cheese (sales*price). Each type of product can include multiple sources e.g., lamb meat and/or culled animal meat etc. All products do not apply to all breeds or production systems e.g., in some systems it is not typical for the farmers to produce cheese on-farm, but to deliver their total production of milk to dairies. Prolificacy, weaning rate, mortality rate, and replacement rate are production traits that have been used in the calculation of the product yields per productive animal (ewe or goat). Yields of milk, meat and cheese prices are expressed on an annual basis.

- Prices: For each product, prices are included separately in the model (in a separate column) and are linked to the constraint expressing product yields.

- Variable costs: The unit costs of all forms of variable capital are included (e.g., prices of purchased feedstuff, variable production costs of home-grown feed which includes expenses for seeds, fertilizers, irrigation, pesticides, etc). Veterinary expenses and drugs per productive animal are also included, as well as other variable expenses (water, electricity, detergents, additives etc.).

Constraints are directly linked to the main factors of production and refer to:

- Land

The model accommodates different types of land typically available to European sheep and goat farms. Therefore, the model accounts for the availability of cropland (crop production mainly for feed) and of grasslands. The average yields of each crop are included in the model. For grazing, the available land is linked to activities (objective function) by including the grazing capacities (annual production of grazing material) in the model.

The model design allows for flexibility when connecting land uses to the dietary needs of animals. In fact, farmers have three options: to let animals graze (natural or cultivated grazing land), to produce feedstuff on-farm or to buy feedstuff from markets. The importance of these three sources may vary and this is reflected in the constraints of the model.

- Labor

Labor constraints constitute a significant part of the model. Labor requirements are expressed in h/animal/year required to perform all tasks related to farm management (including grazing). In other words, the generic specification of the model requires only to input the total labor requirements. The Right Hand Side (RHS) of the model, which expresses input availability, requires that the available labor is included. Here, the available family labor is included (hours/year) without additional costs (i.e., the implicit costs of family labor are not included). Farms have the option to resort to hired labor, but at a cost and in some specific systems can hire up to three persons.

- Variable capital requirements

These include purchased feedstuff (forage silage, clover, straw) and concentrates (maize, barley, wheat, flakes, cotton cake, soya), veterinary expenses (services, drugs, and other treatments), crop production expenses for feedstuff (clover, maize, wheat, barley) etc. They are all included as separate constraints. An additional constraint sums up the individual elements of variable cost and expresses the overall capital requirements of the farm. The SMARTER model allows the RHS in this constraint to vary, corresponding to different levels of capital availability, examining scenarios of intensification of the production system.

- Animal and flock-related constraints

The model includes separate constraints for the energy and protein requirements of animals (metabolizable energy (ME, MJ/animal/year); effective rumen degradable protein (ERDP/animal/year); digestive undegradable protein (DUP/animal/year)). In addition, separate constraints account for the nutritional content of feedstuff consumed in farms and for grazing material (ME, ERDP, DUP), based on the profile of a typical Mediterranean grassland of average quality. Additional constraints involve the minimum and maximum percentages of certain feeds.

Table 1. Linear Programming Matrix.

Objective Function (Max)	Production			Breeding	Purchased feed			Home-grown feed			Labor
	MilkPrice	MeatPrice	CheesePrice	VCsheep	VCpur1	…	VCpurN	VCcul1	…	VCculN	HLAB
AL Y ≥								UL1	…	ULN	
AFL Y≥			RFL1	RFL2				RFL3	…	RFLN	
0 ≥			RHL1	RHL2				RHL3			-1
AHL Y≥											1
AVC Y≥				VCBreed	1	…	1	1	…	1	
0≥				NutrReq	-NCpur1	…	-NCpurN	-NCcul1	…	-NCculN	
0 ≥	ProdMilk	ProdMeat	Prod_Cheese								

Available land (AL) and used irrigated and non-irrigated land for production of feed on-farm (UL) and grazing.
Available family labor (AFL) and required family labor (RFL) for animal breeding and production of milk and meat, cheese, on-farm production of feed and animal grazing.
Available hired labor (AHL) and required hired labor (RHL) for animal breeding and production of milk and meat, cheese, on-farm production of feed and animal grazing.
Available variable capital to the farm for breeding animals, purchasing feed, and producing feed on-farm.
Nutritional Requirements of the animals (NutrReq) and nutritional content of feed (NCpur and NCcul) and of grazing material.

The solution of the model indicates the appropriate structure of the farm and highlights the adjustments that are required at farm and/or production system level to fully exploit its potential. However, to model performance under new traits that make animals more tolerant to infectious and non-infectious diseases, extra variables were added. Moreover, relative constraints introduced to the model to account for (i) the prevalence of the disease in the flock for a typical farm, (ii) the impact of the disease on milk yield, (iii) the increase in veterinary expenses and drug cost for the treatment of the sick animals, (iv) the impact on labor requirements (extra labor time) for checking and treating the animals, (v) the impact of the disease on lamb/kid and ewe/goat carcass weight. In the SMARTER model the infected animals were modeled separately (variables “Sheep2”, “Sheep3” and “Sheep4” in the LP code).

Two scenarios are investigated with the SMARTER model. First, the model simulates farm performance under the presence of Mastitis, GIN parasites and lameness (disease plan). In the second scenario (future plan) the solution demonstrates the optimal organization of the farm under perfect conditions where no diseases occur. The results produced under these two scenarios are then compared and the economic and structural adjustments are discussed, highlighting the impact of new traits that make animals tolerant to diseases on farm sustainability.

3.2 Data

The technical and economic data for the empirical application model for 6 typical farms of different breeds (5 sheep breeds and one goat breed) were collected through a farm management survey during the 2018-2020 period. All farms were in Greece except for the Lacaune sheep farm that was located in France. The data for Frizarta sheep were provided by the FRIZARTA breeding organization, while data for Lacaune sheep were provided by the Institute De L'elevage (IDELE) in cooperation with the French Livestock farms network "INOSYS Réseauxd'élevage" in France. The selected breeds included in the analysis cover most of the prevailing production systems in Europe, ranging from extensive and semi-extensive to intensive patterns.

Information for the prevalence of mastitis, GIN parasitism and lameness and their impact on the farm indicators was based on relevant literature (Table 2). In cases where information was lacking, inputs were based on experts judgement; animal husbandry ex-perts and veterinarians that are familiar with the specific breeds and the systems in which these breeds are reared provided us with the required data. It must be mentioned that for the Lacaune sheep breed, IDELE experts did not provide us with data for lameness. Moreover, in cases where information was not available for a specific breed, data from an-other breed was used.

Table 2. Impact of diseases on farm indicators.

Impact on farm indicators	Type of disease	Chios sheep	Assaf sheep	Boutsiko sheep	Frizarta sheep	Lacaune sheep	Skopelos goats
Prevalence in flock (%)	Mastitis	15%[1]	10%[12]	27%[12]	20%[20]	22%[23]	24%[4]
	GIN	35%[4]	43%[14]	47%[17]	35%[5]	10%[23]	12%[26]
	Lameness	7%[8]	9%[7]	9%[10]	9%[22]	-	9%[7]
Reduction in milk yield (%)	Mastitis	38%[2]	37%[13]	43%[16]	21%[21]	10%[23]	15%[24]
	GIN	22%[5]	11%[15]	8.5%[18]	22%[4]	10%[23]	5%[27]
	Lameness	19.3%[9]	19.3%[9]	19.3%[9]	19.3%[9]	-	19%[28]
Increase in vet/drug cost for treatment (in €/ewe-goat)	Mastitis	4€[3]	4€[3]	4€[3]	4€[3]	3€[23]	1.6€[25]
	GIN	3€[6]	3€[6]	3€[6]	3€[6]	5€[23]	4.5€[29]
	Lameness	4.26€[10]	4.26€[10]	4.26€[10]	4.26€[10]	-	4.26€[10]
extra time spent for treating disease (in hrs per ewe-goat)	Mastitis	1h[3]	1h[3]	1h[3]	1h[8]	0.25h[23]	1h[3]
	Lameness	1.8h[11]	1.8h[11]	1.8h[11]	1.8h[11]	-	1.8h[11]
Reduction in ewe/goat carcass due to disease (%)	GIN	15%[7]	2%[5]	5%[19]	-	-	-
	Lameness	8%[11]	8%[11]	8%[11]	8%[11]	-	8%[11]

[1] Bramis [32]; [2]Saratsis et al. [33]; [3]Theodoridis et al. [11]; [4]Expert judgement; [5]Mavrot et al. [34]; [6]Charlier et al. [35]; [7]Termatzidou et al. [36]; [8]Gelasakis [37]; [9]Gelasakis et al. [38]; [10]Winter and Green [39]; [11]Nieuwhof et al. [40]; [12]Vasileiou et al. [41]; [13]Leitner et al. [42]; [14]Martinez-Valladares et al. [43]; [15]Cruz-Rozo et al. [44]; [16]Martí-De Olives [45]; [17]Kouam et al. [46]; [18]Suarez et al. [47]; [19]Arsenos et al. [48]; [20]Skoufos et al. [49], [21]Albenzio et al. [50]; [22]Moschovas et al. [51]; [23]IDELE & INRAE Experts judgement, [24]Gelasakis et al. [52], [25]Batzios [53], [26]Vouraki et al. [54]; [27]Papanikolopoulou et al. [55]; [28]Deeming et al. [56]; [29]SOLID project results [https://www.solidairy.eu/].

Data in Table 2 shows that the prevalence of clinical and sub-clinical mastitis on these breeds varies from 10% in Assaf sheep breed, which is reared intensively, and ani-mals are fed exclusively on purchased concentrates and forage with very limited access to pasture, to 27% in Boutsiko sheep, which are reared under an extensive system, mostly grazing on natural grasslands. The prevalence of

GIN parasites varies from 10% in La-caune sheep in France to 47% in Boutsiko sheep, while the prevalence of lameness has been set to 7% for the Chios sheep and 9% for the rest of the breeds.

Milk yield reduction due to mastitis varied from 10% in Lacaune sheep to 43% in Boutsiko sheep. The impact of GIN parasites on milk yield is smaller; the reduction varies from 5% in Skopelos goats to 22% in Chios and Frizarta sheep. There is no information available regarding the impact of lameness on milk production, except from the study of Gelasakis et al. [38] who reported a reduction of 19.3% in sheep milk yield and the study of Deeming et al. [56] who reported a reduction of 19% in goat milk yield. In the absence of data for specific breeds, the finding of Gelasakis et al. [38] was generalized for all sheep breeds under the present study.

The increase in veterinary services and drug cost for the treatment of mastitis is 1.6€ per goat annually [53] and 3€ to 4€ per ewe annually [11, IDELE experts), while the cost for the treatment of parasites varies from 3€ to 5€ [35, IDELE experts, SOLID project re-sults]. The increase in the cost for treating the animals with lameness is estimated at 4.26€ per productive animal annually [39]. The extra time spent in checking and treating the animals is estimated at 1 hour per animal annually for mastitis [11](IDELE reported 0.25 hours per Lacaune ewe) and 1.8 hours per animal for lameness[40]. There was no infor-mation available for GIN parasites.

The reduction in the carcass weight of a ewe with GIN parasites compared to a healthy animal was 2% for Assaf sheep [44], 5% for Boutsiko sheep [48] and 15% for Chios sheep. There was no available data for the rest of the breeds. According to Nieuwhof et al. [40], the reduction in ewe meat production due to lameness was 8% and this percentage was assumed for all breeds.

4 Results and Discussion

Tables 3 and 4 describe the current situation of studied farms and the results of the application of LP SMARTER model under the two scenarios. The current situation describes the technical and economic characteristics of the farms under the existing organization of the farm. Table 3 presents the results of the semi-intensive and intensive farms (Chios, Assaf and Frizarta farms) and Table 4 the results of the semi-extensive and extensive farms (Boutsiko, Lacaune and Skopelos farms). In Scenario 1, where all diseases are present in the Chios sheep flock (disease plan), the optimal structure of the farm rears 387 ewes and utilizes 1.3 ha of land to produce maize and for grazing. The optimal farm increases its flock size by 66% compared to the current situation to utilize economies of scale, since Chios sheep farms operate under semi-intensive systems with modern infrastructure and high investments on fixed capital. The results show that the available land for producing feed on-farm is reduced substantially (from 17 to 1.3 hectares (ha)) and relies mainly on purchased feed (the analytical results of the simulations are presented in the Spreadsheet S2). The dependence on home-grown concentrates is reduced from 81.6% to 45%, while under the optimal structure the farm only purchases forage, which includes silage and clover. The results also indicate that three workers are employed full-time to assist the family of two members fully committed to farm work. The main product of the farm is milk; most of it is sold to the dairy industry and the rest is used for cheese production on-farm and is sold directly to consumers (analytical results in Spreadsheet S2). Moreover, in the optimal plan under Scenario 1 the gross revenues of the farm are 358€/ ewe. Variable costs such as expenses for purchased feeds, seeds and agrochemicals, veterinary expenses, fuel etc., are 75€/ ewe, while the gross margin is 283€/ ewe. The future plan with no diseases, showed remarkable similarity with the optimal plan of the current situation in terms of farm structure. However, the farm differs substantially in terms of financial output. More specifically, although the farm has the same number of animals and same human labor with only marginal changes in ration formulations, the gross margin per ewe is increased by 15.9%, indicating a significant improvement in the economic performance of the farm.

Assaf sheep farms in Greece, operate under intensive systems that depend mostly on concentrates and forage produced on-farm, in which animals have very limited access to pasture. Farms usually cultivate relatively large areas and are large in flock size, with modern infrastructure and high levels of investment. They often use technologically advanced production practices. These farms are market-oriented and pursue (and achieve) high yields and high productivity. They are less resilient to volatile international market conditions and abrupt or unforeseen changes in the market. The optimal structure under Scenario 1 indicates that a typical Assaf farm rears 835 ewes, showing a large increase compared to the current situation. This outcome can be attributed to the fact that access to more human labor is allowed in the model. The available non-irrigated land is used for producing concentrates (wheat) and does not present any differentiation compared to the current situation (analytical results in Spreadsheet S2). However, under Scenario 1, the dependance of the farm on home-grown concentrates is reduced from 37.4% to 20.2%, disconnecting sheep breeding from the use of land. The farm under Scenario 1 produces 33 tons of wheat and relies mainly on off-farm feed (cotton cake, silage, and barley). The whole of milk production is delivered to dairies and meat production accounts for 25.2% of the revenues. The revenues per ewe under the optimal structure in Scenario 1 show a 4.58% increase compared to the current situation. Combined with the significant reduction in variable cost (18.5%) this results in a 35% increase in gross margin. The structure of the optimal farm and the management plan under Scenario 2 does not change compared to that in Scenario 1; however, the financial results are significantly improved. When diseases are not present in the flock, the revenues are increased by 8.4% (from 274€/ ewe to 297€/ ewe). Variable cost does not change markedly (123€/ewe and 121€/ewe, in Scenario 1 and 2, respectively), and gross margin is increased by 17.3% (from 150€/ ewe to 176€/ ewe).

Frizarta sheep farms in Greece are usually reared under semi-intensive, dual-purpose systems. Milk production constitutes the most economically important source of income; however, meat also contributes significantly. They use relatively new technology but with low levels of innovation. Grazing is common on these farms, covering a large part of animal nutritional needs. Meat production is mostly suckling lambs and on-farm production of forage, and some concentrates (mainly winter cereal) is not uncommon. Frizarta farms range from medium-sized to very large. The results in Table 3 show that the optimal farm under Scenario 1 rears 263 ewes (23 ewes more than in the current situation) and uses 26 hectares of land for grazing and production of feed (9 hectares less than in the current situation). The analytical results of the LP model (Spreadsheet S2) show that in the optimal plan the land is used mainly for grazing (21 ha compared to 14 ha in the current situation). Moreover, the farm cultivates 1 ha for wheat and 4 ha for maize and clover. The dependance on home-grown forage decreased to 68.4% in Scenario 1, while the dependance on concentrates increased from 3.5% to 79.6%. The farm uses 2 people for breeding animals and cultivating crops for feed. The gross revenues increased by 4% and the variable cost is decreased by 21.1%, leading to an increase in gross margin by 21.3% (from 150€/ ewe to 182€/ ewe). Under Scenario 2 (future plan with healthy flock), the farm rears 270 ewes, uses the same land as in Scenario 1 and accommodates the same labor. The ration formation does not change compared to Scenario 1 and this is reflected also to variable cost, which remains almost the same. Milk is delivered to dairies and meat production (lamb and ewe meat) contributes 22% to gross revenues. Financial results improve when the animals in the flock are tolerant to diseases. Gross revenues and gross margin increase by 12.1% (from 264€/ ewe to 296€/ ewe) and 18.1% (from 182€/ ewe to 215€/ ewe), respectively.

Table 3. Results of the LP model under two different scenarios for semi-intensive and intensive farms.

Chios sheep (GR)	Current situation	Optimal situation	
		Scenario 1	Scenario 2
		Diseases present	No diseases
Ewes	233	387	387
Land[1] (ha)	17	1.3	1.3
Labor (hrs)	6425	6300	6300
Forage (tonnes)[2]	82 (36.6%)	123.7 (0.0%)	123.6 (0.0%)
Concentrates (tonnes)[2]	47.2 (81.6%)	30.9 (45.0%)	30.9 (45.0%)
Gross revenue (€)[3]	79919 (343)	138592 (358)	155300 (401)
Variable cost (€)[3]	29125 (125)	29063 (75)	28287 (73)
Gross margin (€)[3]	50794 (218)	109530 (283)	127013 (328)
AssafE sheep (GR)	Current situation	Optimal situation	
		Diseases present	No diseases
Ewes	490	835	857
Land[1] (ha)	15	15	15
Labor (hrs)	4820	8400	8400
Forage (tonnes)[2]	275.0 (0%)	652.9 (0%)	670.0 (0%)
Concentrates (tonnes)[2]	72.3 (37.4%)	163.2 (20.2%)	167.6 (19.7%)
Gross revenue (€)[3]	128250 (262)	228560 (274)	254743 (297)
Variable cost (€)[3]	74185 (151)	103008 (123)	104081 (121)
Gross margin (€)[3]	54065 (111)	125553 (151)	150662 (176)
Frizarta sheep (GR)	Current situation	Optimal situation	
		Diseases present	No diseases
Ewes	240	263	270
Land[1] (ha)	35	26	26
Labor (hrs)	4200	4200	4200
Forage (tonnes)[2]	48.0 (100%)	36.0 (68.4%)	38.8 (62.8%)
Concentrates (tonnes)[2]	31.1 (3.5%)	28.4 (79.6%)	28.8 (79.6%)
Gross revenue (€)[3]	60936 (254)	69381 (264)	79817 (296)
Variable cost (€)[3]	25012 (104)	21487 (82)	21740 (81)
Gross margin (€)[3]	35924 (150)	47894 (182)	58076 (215)

[1] includes irrigated and non-irrigated land for on-farm production of feed and grazing land
[2] the figure in the parenthesis indicates the percentage of home-grown feed in total feed
[3] the figure in the parenthesis refers to €/ewe

Regarding the profile of new farms where animals are healthy , the optimal plan of the most intensive production systems, i.e. Chios, Assaf, and Frizarta, coincides with that described by Theodoridis et al. [57], Pulina et al. [1], Vouraki et al. [58] and Schuh et al. [59], who reported that farms which base their operation on fixed capital investments, highly productive animals, purchased feed and hired skilled labor should utilize economies of scale for by reducing fixed cost per unit of product. These farms should be large, organize labor more rationally, implement labor-saving technologies and reduce their dependency on home-gown feed; a strategy described by Ragkos et al. [27]. Moreover, these dairy farms should utilize meat production to increase their economic resilience and reduce their risk in a market where margins to lower production costs have been narrowed down [60]. In general, the shift of the sheep and goat sector towards intensification [61], indicates the need for optimal livestock management to ensure the survival and the resilience of the sector [2,62, 63, 64].

The results from the implementation of the LP model on the semi-extensive and extensive farms (Boutsiko, Lacaune and Skopelos farms) are presented in Table 4. Boutsiko sheep farms in Greece are in most cases relatively small, low-milk yield dairy farms selling their milk to local cheesemakers. Boutsiko farms operate under extensive and/or semi-extensive systems and it is very common that these farms are transhumant, spending their summers in the highlands and winters in lowlands, moving up to 300-400km between the two, providing, therefore ecosystem services in the uplands as well as the lowlands. These farms sometimes specialize in meat production of high quality, however, not under a formal certification scheme. These transhumant farms achieve acceptable incomes and contribute to the viability and culture of their respective communities. The structure under Scenario 1 shows that in the optimal plan the farm rears 86 ewes, 22 ewes less than in the existing current situation. However, the optimal plan involves a substantial increase in the use of land for grazing (from 16 to 48 ha). Supplementary feeding is used mainly during the winter and all concentrates are purchased off-farm. The optimal plan also indicates a more rational utilization of human labor (from 48.6 hours per ewe in the current situation to 36 in Scenario 1 and 2). The results show that under the appropriate structure in Scenario 1, revenues are decreased by 10.2% compared to the existing situation (from 118€/ ewe to 106€/ewe); however, the decrease in variable cost, mainly due to the optimal feeding strategy, by 54.8% (from 84€/ewe to 38€/ewe) results in an improved gross margin (from 34€/ ewe to 86€/ ewe). Under Scenario 2, the structural characteristics of the optimal farm plan do not change; however, breeding animals resistant to diseases leads to improved financial results. Compared to the optimal plan in Scenario 1, revenues are increased by 12.3% (from 106€/ ewe to 119€/ewe) and the gross margin is increased by 23.5% (from 68€/ ewe to 84€/ ewe), although the change in variable cost is trivial.in Scenario 2.

The Lacaune sheep farm selected for the LP model simulation operates under the semi-extensive farming system and is located in Roquefort areas in France. These farms meet the animals' nutritional needs mostly through grazing, and supplementation with forage and concentrates produced on-farm. Data were collected by IDELE in cooperation with the French Livestock farms network "INOSYS Réseaux d'élevage". More information on the applied management and production practices in Lacaune farms in Roquefort can be found in Theodoridis et al. (2022). The results of the LP show that the optimal farm in Scenario 1 rears 468 ewes (68 more than in the existing current situation) and uses 46 ha (24 ha less than in the existing current situation). The land is used for grazing (26 ha) and the production of feed on-farm (12 ha of non-irrigated land and 8 ha of irrigated land) (Supplementary file S2). The dependance on home-grown feed is very high in both production plans. Labor used does not change among the production plans (existing and optimal plan under scenario 1); however, it is allocated more efficiently in the optimal plan. In the optimal production plan, revenues are increased by 5.8% (from 345€/ ewe to 365€/ ewe) compared to the current situation, variable cost is reduced by 22.8% (from 105€/ ewe to 81€/ ewe) and gross margin, which indicates the sustainability of the farm in the short-run, is increased by 18.3% (from 240€/ ewe to 284€/ ewe). Under Scenario 2 the results show that the structural characteristics of the optimal farm are the same as those in Scenario 1. The financial results are also similar for the two optimal plans, since disease prevalence and its impact is relatively small. Moreover, the LP model implemented on Lacaune sheep did not simulate the impact of lameness, due to lack of data. The farm that rears resilient animals achieves higher revenues by 2.5%, the variable cost is the same and the gross margin is increased by 3.9%.

The Skopelos goat farms selected for simulation in this application are reared under extensive and semi-extensive systems, situated predominantly in less favourable areas (LFAs). They typically achieve low milk yields and manufacture cheese on-farm. Skopelos farms are characterized by low investment in facilities and machinery and the use of family labor. Animals mainly graze, but supplementary concentrates are also provided. In Scenario 1, where all diseases are present in the Skopelos flock, the optimal structure of the farm rears 399 goats (33% more than in the existing current situation) and utilizes 28 ha of land for grazing and for producing maize. In the existing current situation, the farm relies only on purchased concentrates, but the optimal plan under Scenario 1 recommends 45% dependence on home-grown feed. Meat production and on-farm cheese production account for 22% and 34% of the revenues in the optimal plan, respectively. Revenues in the optimal structure of the farm under Scenario 1 are increased by 15.2% (from 99€/ goat to 114€/ goat), variable cost is reduced by 17.3%, leading to a 51% increase in the gross margin (from 47€/ goat to 71€/ goat). In Scenario 2, where no diseases are present in the flock, the structure of the optimal farm does not change; however, the farm achieves higher economic results. Revenues are increased by 4.4% (from 114€/ goat to 119€/ goat), variable cost is reduced by 4.6% (from 43€/ goat to 41€/ goat) and the farm achieves a higher gross margin by of 11.3% (from 71€/ goat to 79 €/goat).

Table 4. Results of the LP model under two different scenarios for semi-extensive and extensive farms.

		Optimal situation	
Chios sheep (GR)	Current situation	Scenario 1 Diseases present	Scenario 2 No diseases
Ewes	108	86	87
Land[1] (ha)	16	48	48
Labor (hrs)	5250	3150	3150
Forage (tonnes)[2]	1.3 (0%)	-	-
Concentrates (tonnes)[2]	9.7 (0%)	7.6 (0%)	7.7 0(%)
Gross revenue (€)[3]	12806 (118)	9077 (106)	10320 (119)
Variable cost (€)[3]	9093 (84)	3238 (38)	3026 (35)
Gross margin (€)[3]	3713 (34)	5839 (68)	7239 (84)
		Optimal situation	
AssafE sheep (GR)	Current situation	Diseases present	No diseases
Ewes	400	468	468
Land[1] (ha)	70	46	46
Labor (hrs)	3500	3500	3500
Forage (tonnes)[2]	102.0 (100%)	101.0 (100%)	101.0 (100%)
Concentrates (tonnes)[2]	80.0 (100%)	73.0 (88%)	73.0 (88%)
Gross revenue (€)[3]	137986 (345)	170766 (365)	175179 (374)
Variable cost (€)[3]	42000 (105)	37863 (81)	37320 (80)
Gross margin (€)[3]	95986 (240)	132903 (284)	137860 (295)
		Optimal situation	
Frizarta sheep (GR)	Current situation	Diseases present	No diseases
Ewes	300	399	399
Land[1] (ha)	15	28	28
Labor (hrs)	8825	8566	8429
Forage (tonnes)[2]	15 (0%)	-	-

Concentrates (tonnes)[2]	45 (0%)	47.1 (45%)	47.1 (45%)
Gross revenue (€)[3]	29736 (99)	45392 (114)	47663 (119)
Variable cost (€)[3]	15520 (52)	17030 (43)	16279 (41)
Gross margin (€)[3]	14216 (47)	28362 (71)	31384 (79)

[1] includes irrigated and non-irrigated land for on-farm production of feed and grazing land
[2] the figure in the parenthesis indicates the percentage of home-grown feed in total feed
[3] the figure in the parenthesis refers to €/ewe or goat

The profile that is shaped under the optimal plans for the extensive and semi-extensive systems of Boutsiko sheep and Skopelos goat farms, is aligned with that described in Galanopoulos et al. [65], Ragkos et al. [66], Atzori et al. [67], Theodoridis et al. [68] and Laga et al. [69]. Their findings confirm ours, which show that these labor-intensive farms should manage labor more wisely, reduce their feeding cost through proper use of rangelands and increase their dependency on home-grown feed to mitigate mainly the risk that stems from the market for concentrates. In general, these low-input, grazing-based farms must utilize local breeds through the implementation of integrated breeding programs, develop transparent and sustainable value chains for the promotion of territorial and certified products, and adopt innovative solutions to modernize their operation. The evolution of Lacaune sheep and the production of Roquefort cheese in France constitute a successful example of how a semi-extensive dairy sheep farming system should be designed. Lacaune sheep evolved through genetic improvement programs from a dual purpose, low-yield to a high performing breed that produces a popular, high-added value PDO cheese [70, 71]. The adjustments required by the Lacaune farm to fully utilize the existing technology and the available resources are smaller than in the rest of the breeds and conform with that of Theodoridis et al. [68], who found that more efficient Lacaune farms have a lower dependency on pasture, rely more on purchased feed and use less supplementary feeds.

The results of our study show that the development of resilient, disease-tolerant animals improves the economic performance and the economic sustainability of the farm. This finding is in line with that of Nieuwhof and Bishop [72], Knight-Jones and Rushton [73], Winter and Green [39], Nathues et al. [74], Limon et al. [75], Tadesse et al. [76], who concluded that the reduction of incidences of infectious and non-infectious diseases has direct economic benefit for the farms and the industry. These studies follow a similar approach to ours, considering the associated costs of prevention and treatment but also the reduced animal performance and the corresponding production losses. Our study showed that the improvement in the profitability of the farms stems mainly from the increase of production and not from the reduction in the health care expenses and/or increased labor. This finding is in line with Nieuwhof and Bishop [72] who reported that the main cost source for animals infected with GIN parasites is production loss but is not aligned with that of Winter and Green [39] who found that the main financial benefit from the prevention of lameness results from treatment cost reductions. In addition, the finding that extra time spent for treatment of the animals constitutes a small proportion of the total treatment cost, converges with that of Winter and Green [39].

5 Conclusion

The aim of this study was to develop a mathematical model accounting for parame-ters that could shape new farm profiles for different environmental, technical, and eco-nomic challenges. The SMARTER model simulates the main interactions and trade-offs between the production traits, management practices, prices and local conditions at the farm level and can assess the overall sustainability of breeds and farming systems under various challenges. The model allows the examination of scenarios related to turbulences in the economic environment, development of animals resistant to diseases, shocks in the availability of labor (generational renewal in farms, increased hired labor), environmental impacts on extensive grass-fed systems, changes in the marketing of products (e.g., on-farm cheese production), decision-making regarding the choice of the production sys-tem and indicates the interventions required for optimal farm management. The model operates at farm level and can be adapted to different breeds, farm types and production systems. In this empirical study, where the model was implemented on typical sheep and goat farms of 6 different breeds, the results indicate that the structure of the farm does not change significantly if new resilience animal traits are developed to prevent diseases. This finding is interesting, because it shows that although the occurrence of diseases at given prevalence changes economic performance, the impact is not considered important to impose the farmer to change the management plan. Although the gross margin of the farm is increased in the disease-free scenario (future plan), does not affect the managerial decisions of the farmer. Results also show that the improvement of the economic perfor-mance of the farm is the result of an increase in gross output, not the reduction in the production cost. Moreover, although the farms under study are predominantly focused on milk production, the optimal solution indicates that meat production could also be an important source of income. Meat sales can contribute to the financial stability of farms, which is necessary when negotiating for better milk prices or considering alternative paths for expansion.

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7 Appendix

Spreadsheet 1. Chios (Disease Present)

max	object	.	.
.	object	Sheep	-45.36
.	object	Sheep2	-49.36
.	object	Sheep3	-48.36
.	object	Sheep4	-49.62
.	object	Pmilk	0.96

.	object	Pmilk2	0.96
.	object	Pmilk3	0.96
.	object	Pmilk4	0.96
.	object	PLamMeat	5
.	object	PLamMea2	5
.	object	PLamMea3	5
.	object	PLamMea4	5
.	object	PEweMeat	2.2
.	object	PEweMea2	2.2
.	object	PEweMea3	2.2
.	object	PEweMea4	2.2
.	object	Ch1	7
.	object	Ch2	7
.	object	Ch3	7
.	object	Ch4	7
.	object	Hlab	-3
.	object	VetEx	0
.	object	OtExp	0
.	object	CulWh	-65
.	object	CulMai	-110
.	object	CulClov	-130
.	object	CulBar	-70
.	object	Bar	-.22
.	object	Clov	-0.16
.	object	CotPi	-.25
.	object	Maize	-.22
.	object	Pit	-.25
.	object	Sil	-.045
.	object	Straw	-0.04
.	object	Wheat	-.21
.	object	Milk	0
.	object	Milk2	0
.	object	Milk3	0
.	object	Milk4	0
.	object	Pbar	0
.	object	Pclov	0
.	object	Pmai	0
.	object	PWh	0
.	object	DUP	0
.	object	ERDP	0
.	object	MJ	0
.	object	Gr	0

.	object	Grass	0
Le	IrrCrop	.	.
.	IrrCrop	CulMai	1
.	IrrCrop	CulClov	1
.	IrrCrop	_rhs_	120
Le	NonIrrCr	.	.
.	NonIrrCr	CulWh	1
.	NonIrrCr	CulBar	1
.	NonIrrCr	_rhs_	60
Le	Graze	.	.
.	Graze	Grass	1
.	Graze	_rhs_	800
Le	WheatPr	.	.
.	WheatPr	PWh	1
.	WheatPr	CulWh	-268
.	WheatPr	_rhs_	0
Le	BarleyPr	.	.
.	BarleyPr	Pbar	1
.	BarleyPr	CulBar	-265
.	BarleyPr	_rhs_	0
Le	CloverPr	.	.
.	CloverPr	Pclov	1
.	CloverPr	CulClov	-1350
.	CloverPr	_rhs_	0
Le	MaizePr	.	.
.	MaizePr	Pmai	1
.	MaizePr	CulMai	-1060
.	MaizePr	_rhs_	0
Le	PrGra	.	.
.	PrGra	Grass	-736.41
.	PrGra	Gr	1
.	PrGra	_rhs_	0
Le	Labor	.	.
.	Labor	Sheep	14.2
.	Labor	Sheep2	15.2
.	Labor	Sheep3	14.2
.	Labor	Sheep4	16
.	Labor	Ch1	0.1
.	Labor	Ch2	0.1
.	Labor	Ch3	0.1
.	Labor	Ch4	0.1
.	Labor	CulBar	1.3

.	Labor	CulWh	1.25
.	Labor	CulMai	2.9
.	Labor	CulClov	10
.	Labor	Hlab	-1
.	Labor	_rhs_	4200
Le	Hired	.	.
.	Hired	Hlab	1
.	Hired	_rhs_	2100
Le	Myie	.	.
.	Myie	Sheep	-230
.	Myie	Milk	1
.	Myie	_rhs_	0
Le	Msale	.	.
.	Msale	Pmilk	1
.	Msale	Ch1	3.5
.	Msale	Milk	-1
.	Msale	_rhs_	0
Le	Cheese	.	.
.	Cheese	Pmilk	-0.3
.	Cheese	Ch1	2.45
.	Cheese	_rhs_	0
Le	LambMeat	.	.
.	LambMeat	Sheep	-19.5
.	LambMeat	PLamMeat	1
.	LambMeat	_rhs_	0
Le	EweMeat	.	.
.	EweMeat	Sheep	-5
.	EweMeat	PEweMeat	1
.	EweMeat	_rhs_	0
Le	Myie2	.	.
.	Myie2	Sheep2	-143
.	Myie2	Milk2	1
.	Myie2	_rhs_	0
Le	Msale2	.	.
.	Msale2	Pmilk2	1
.	Msale2	Ch2	3.5
.	Msale2	Milk2	-1
.	Msale2	_rhs_	0
Le	Cheese2	.	.
.	Cheese2	Pmilk2	-0.3
.	Cheese2	Ch2	2.45
.	Cheese2	_rhs_	0

Le	LambMea2	.	.
.	LambMea2	Sheep2	-19.5
.	LambMea2	PLamMea2	1
.	LambMea2	_rhs_	0
Le	EweMeat2	.	.
.	EweMeat2	Sheep2	-5
.	EweMeat2	PEweMea2	1
.	EweMeat2	_rhs_	0
Le	Myie3	.	.
.	Myie3	Sheep3	-180
.	Myie3	Milk3	1
.	Myie3	_rhs_	0
Le	Msale3	.	.
.	Msale3	Pmilk3	1
.	Msale3	Ch3	3.5
.	Msale3	Milk3	-1
.	Msale3	_rhs_	0
Le	Cheese3	.	.
.	Cheese3	Pmilk3	-0.3
.	Cheese3	Ch3	2.45
.	Cheese3	_rhs_	0
Le	LambMea3	.	.
.	LambMea3	Sheep3	-19.5
.	LambMea3	PLamMea3	1
.	LambMea3	_rhs_	0
Le	EweMeat3	.	.
.	EweMeat3	Sheep3	-4.25
.	EweMeat3	PEweMea3	1
.	EweMeat3	_rhs_	0
Le	Myie4	.	.
.	Myie4	Sheep4	-186
.	Myie4	Milk4	1
.	Myie4	_rhs_	0
Le	Msale4	.	.
.	Msale4	Pmilk4	1
.	Msale4	Ch4	3.5
.	Msale4	Milk4	-1
.	Msale4	_rhs_	0
Le	Cheese4	.	.
.	Cheese4	Pmilk4	-0.3
.	Cheese4	Ch4	2.45
.	Cheese4	_rhs_	0

Le	LambMea4	.	.
.	LambMea4	Sheep4	-19.5
.	LambMea4	PLamMea4	1
.	LambMea4	_rhs_	0
Le	EweMeat4	.	.
.	EweMeat4	Sheep4	-4.6
.	EweMeat4	PEweMea4	1
.	EweMeat4	_rhs_	0
Le	MJ	.	.
.	MJ	Sheep	3800
.	MJ	Sheep2	3800
.	MJ	Sheep3	3800
.	MJ	Sheep4	3800
.	MJ	MJ	-1
.	MJ	_rhs_	0
Le	ERDPS	.	.
.	ERDPS	Sheep	43000
.	ERDPS	Sheep2	43000
.	ERDPS	Sheep3	43000
.	ERDPS	Sheep4	43000
.	ERDPS	ERDP	-1
.	ERDPS	_rhs_	0
Le	DUPS	.	.
.	DUPS	Sheep	2400
.	DUPS	Sheep2	2400
.	DUPS	Sheep3	2400
.	DUPS	Sheep4	2400
.	DUPS	DUP	-1
.	DUPS	_rhs_	0
Le	RMIn	.	.
.	RMIn	PWh	-0.8
.	RMIn	Pmai	-0.8
.	RMIn	Pclov	0.2
.	RMIn	Pbar	-0.8
.	RMIn	Sil	0.2
.	RMIn	Clov	0.2
.	RMIn	Straw	0.2
.	RMIn	Maize	-0.8
.	RMIn	Bar	-0.8
.	RMIn	Wheat	-0.8
.	RMIn	Pit	-0.8
.	RMIn	CotPi	-0.8

.	RMIn	Gr	0.2
.	RMIn	_rhs_	0
Le	Rmax	.	.
.	Rmax	PWh	0.5
.	Rmax	Pmai	0.5
.	Rmax	Pclov	-0.5
.	Rmax	Pbar	0.5
.	Rmax	Sil	-0.5
.	Rmax	Clov	-0.5
.	Rmax	Straw	-0.5
.	Rmax	Maize	0.5
.	Rmax	Bar	0.5
.	Rmax	Wheat	0.5
.	Rmax	Pit	0.5
.	Rmax	CotPi	0.5
.	Rmax	Gr	-0.5
.	Rmax	_rhs_	0
Le	MiPit	.	.
.	MiPit	PWh	-0.15
.	MiPit	Pmai	-0.15
.	MiPit	Pbar	-0.15
.	MiPit	Maize	-0.15
.	MiPit	Bar	-0.15
.	MiPit	Wheat	-0.15
.	MiPit	Pit	0.85
.	MiPit	CotPi	-0.15
.	MiPit	_rhs_	0
Le	MiCPi	.	.
.	MiCPi	PWh	-0.12
.	MiCPi	Pmai	-0.12
.	MiCPi	Pbar	-0.12
.	MiCPi	Maize	-0.12
.	MiCPi	Bar	-0.12
.	MiCPi	Wheat	-0.12
.	MiCPi	Pit	-0.12
.	MiCPi	CotPi	0.88
.	MiCPi	_rhs_	0
Le	MiMai	.	.
.	MiMai	PWh	-0.45
.	MiMai	Pmai	0.55
.	MiMai	Pbar	-0.45
.	MiMai	Maize	0.55

.	MiMai	Bar	-0.45
.	MiMai	Wheat	-0.45
.	MiMai	Pit	-0.45
.	MiMai	CotPi	-0.45
.	MiMai	_rhs_	0
Le	MJF	.	.
.	MJF	PWh	-13.3
.	MJF	Pmai	-13.6
.	MJF	Pclov	-8.4
.	MJF	Pbar	-13.3
.	MJF	Sil	-9.8
.	MJF	Clov	-8.4
.	MJF	Straw	-11.2
.	MJF	Maize	-13.6
.	MJF	Bar	-13.3
.	MJF	Wheat	-13.3
.	MJF	Pit	-13.7
.	MJF	CotPi	-13.2
.	MJF	Gr	-7.5
.	MJF	MJ	1
.	MJF	_rhs_	0
Le	ERDPF	.	.
.	ERDPF	PWh	-59
.	ERDPF	Pmai	-33
.	ERDPF	Pclov	-118
.	ERDPF	Pbar	-59
.	ERDPF	Sil	-118
.	ERDPF	Clov	-118
.	ERDPF	Straw	-64
.	ERDPF	Maize	-33
.	ERDPF	Bar	-59
.	ERDPF	Wheat	-59
.	ERDPF	Pit	-104
.	ERDPF	CotPi	-222
.	ERDPF	Gr	-52
.	ERDPF	ERDP	1
.	ERDPF	_rhs_	0
Le	DUPF	.	.
.	DUPF	PWh	-14
.	DUPF	Pmai	-61
.	DUPF	Pclov	-25
.	DUPF	Pbar	-14

.	DUPF	Sil	-25
.	DUPF	Clov	-25
.	DUPF	Straw	-21
.	DUPF	Maize	-61
.	DUPF	Bar	-14
.	DUPF	Wheat	-14
.	DUPF	Pit	-10
.	DUPF	CotPi	-109
.	DUPF	Gr	-33
.	DUPF	DUP	1
.	DUPF	_rhs_	0
Le	VetExp	.	.
.	VetExp	Sheep	-16.8
.	VetExp	Sheep2	-20.8
.	VetExp	Sheep3	-19.8
.	VetExp	Sheep4	-21.06
.	VetExp	VetEx	1
.	VetExp	_rhs_	0
Le	OthExp	.	.
.	OthExp	Sheep	-28.56
.	OthExp	Sheep2	-28.56
.	OthExp	Sheep3	-28.56
.	OthExp	Sheep4	-28.56
.	OthExp	OtExp	1
.	OthExp	_rhs_	0
Le	VCTot	.	.
.	VCTot	Sheep	45.36
.	VCTot	Sheep2	49.36
.	VCTot	Sheep3	48.36
.	VCTot	Sheep4	49.62
.	VCTot	CulWh	65
.	VCTot	CulMai	110
.	VCTot	CulClov	130
.	VCTot	CulBar	70
.	VCTot	Clov	0.16
.	VCTot	Straw	0.04
.	VCTot	Maize	0.22
.	VCTot	Bar	0.22
.	VCTot	Wheat	0.21
.	VCTot	Pit	0.25
.	VCTot	CotPi	0.25
.	VCTot	Sil	0.045

.	VCTot	_rhs_	500000
Le	GM	.	.
.	GM	Sheep	-45.36
.	GM	Sheep2	-49.36
.	GM	Sheep3	-48.36
.	GM	Sheep4	-49.62
.	GM	Pmilk	0.96
.	GM	Pmilk2	0.96
.	GM	Pmilk3	0.96
.	GM	Pmilk4	0.96
.	GM	PLamMeat	5
.	GM	PLamMea2	5
.	GM	PLamMea3	5
.	GM	PLamMea4	5
.	GM	PEweMeat	2.2
.	GM	PEweMea2	2.2
.	GM	PEweMea3	2.2
.	GM	PEweMea4	2.2
.	GM	Ch1	7
.	GM	Ch2	7
.	GM	Ch3	7
.	GM	Ch4	7
.	GM	CulWh	-65
.	GM	CulMai	-110
.	GM	CulClov	-130
.	GM	CulBar	-70
.	GM	Bar	-.22
.	GM	Clov	-0.16
.	GM	CotPi	-.25
.	GM	Maize	-.22
.	GM	Pit	-.25
.	GM	Sil	-.045
.	GM	Straw	-0.04
.	GM	Wheat	-.21
.	GM	_rhs_	5000000
Le	Sick	.	.
.	Sick	Sheep	0.15
.	Sick	Sheep2	-0.85
.	Sick	Sheep3	0.15
.	Sick	Sheep4	0.15
.	Sick	_rhs_	0
Le	Sick2	.	.

.	Sick2	Sheep	0.35
.	Sick2	Sheep2	0.35
.	Sick2	Sheep3	-0.65
.	Sick2	Sheep4	0.35
.	Sick2	_rhs_	0
Le	Sick3	.	.
.	Sick3	Sheep	0.07
.	Sick3	Sheep2	0.07
.	Sick3	Sheep3	0.07
.	Sick3	Sheep4	-0.93
.	Sick3	_rhs_	0

Spreadsheet 1. Chios (No Diseases)

max	object	.	.
.	object	Sheep	-45.36
.	object	Pmilk	0.96
.	object	PLamMeat	5
.	object	PEweMeat	2.2
.	object	Ch1	7
.	object	Hlab	-3
.	object	VetEx	0
.	object	OtExp	0
.	object	CulWh	-65
.	object	CulMai	-110
.	object	CulClov	-130
.	object	CulBar	-70
.	object	Bar	-.22
.	object	Clov	-0.16
.	object	CotPi	-.25
.	object	Maize	-.22
.	object	Pit	-.25
.	object	Sil	-.045
.	object	Straw	-0.04
.	object	Wheat	-.21
.	object	Milk	0
.	object	Pbar	0
.	object	Pclov	0

.	object	Pmai	0
.	object	PWh	0
.	object	DUP	0
.	object	ERDP	0
.	object	MJ	0
.	object	Gr	0
.	object	Grass	0
Le	IrrCrop	.	.
.	IrrCrop	CulMai	1
.	IrrCrop	CulClov	1
.	IrrCrop	_rhs_	120
Le	NonIrrCr	.	.
.	NonIrrCr	CulWh	1
.	NonIrrCr	CulBar	1
.	NonIrrCr	_rhs_	60
Le	Graze	.	.
.	Graze	Grass	1
.	Graze	_rhs_	800
Le	WheatPr	.	.
.	WheatPr	PWh	1
.	WheatPr	CulWh	-268
.	WheatPr	_rhs_	0
Le	BarleyPr	.	.
.	BarleyPr	Pbar	1
.	BarleyPr	CulBar	-265
.	BarleyPr	_rhs_	0
Le	CloverPr	.	.
.	CloverPr	Pclov	1
.	CloverPr	CulClov	-1350
.	CloverPr	_rhs_	0
Le	MaizePr	.	.
.	MaizePr	Pmai	1
.	MaizePr	CulMai	-1060
.	MaizePr	_rhs_	0
Le	PrGra	.	.
.	PrGra	Grass	-736.41
.	PrGra	Gr	1
.	PrGra	_rhs_	0
Le	Labor	.	.
.	Labor	Sheep	14.2
.	Labor	Ch1	0.1
.	Labor	CulBar	1.3

.	Labor	CulWh	1.25
.	Labor	CulMai	2.9
.	Labor	CulClov	10
.	Labor	Hlab	-1
.	Labor	_rhs_	4200
Le	Hired	.	.
.	Hired	Hlab	1
.	Hired	_rhs_	2100
Le	Myie	.	.
.	Myie	Sheep	-230
.	Myie	Milk	1
.	Myie	_rhs_	0
Le	Msale	.	.
.	Msale	Pmilk	1
.	Msale	Ch1	3.5
.	Msale	Milk	-1
.	Msale	_rhs_	0
Le	Cheese	.	.
.	Cheese	Pmilk	-0.3
.	Cheese	Ch1	2.45
.	Cheese	_rhs_	0
Le	LambMeat	.	.
.	LambMeat	Sheep	-19.5
.	LambMeat	PLamMeat	1
.	LambMeat	_rhs_	0
Le	EweMeat	.	.
.	EweMeat	Sheep	-5
.	EweMeat	PEweMeat	1
.	EweMeat	_rhs_	0
Le	MJ	.	.
.	MJ	Sheep	3800
.	MJ	MJ	-1
.	MJ	_rhs_	0
Le	ERDPS	.	.
.	ERDPS	Sheep	43000
.	ERDPS	ERDP	-1
.	ERDPS	_rhs_	0
Le	DUPS	.	.
.	DUPS	Sheep	2400
.	DUPS	DUP	-1
.	DUPS	_rhs_	0
Le	RMIn	.	.

.	RMIn	PWh	-0.8
.	RMIn	Pmai	-0.8
.	RMIn	Pclov	0.2
.	RMIn	Pbar	-0.8
.	RMIn	Sil	0.2
.	RMIn	Clov	0.2
.	RMIn	Straw	0.2
.	RMIn	Maize	-0.8
.	RMIn	Bar	-0.8
.	RMIn	Wheat	-0.8
.	RMIn	Pit	-0.8
.	RMIn	CotPi	-0.8
.	RMIn	Gr	0.2
.	RMIn	_rhs_	0
Le	Rmax	.	.
.	Rmax	PWh	0.5
.	Rmax	Pmai	0.5
.	Rmax	Pclov	-0.5
.	Rmax	Pbar	0.5
.	Rmax	Sil	-0.5
.	Rmax	Clov	-0.5
.	Rmax	Straw	-0.5
.	Rmax	Maize	0.5
.	Rmax	Bar	0.5
.	Rmax	Wheat	0.5
.	Rmax	Pit	0.5
.	Rmax	CotPi	0.5
.	Rmax	Gr	-0.5
.	Rmax	_rhs_	0
Le	MiPit	.	.
.	MiPit	PWh	-0.15
.	MiPit	Pmai	-0.15
.	MiPit	Pbar	-0.15
.	MiPit	Maize	-0.15
.	MiPit	Bar	-0.15
.	MiPit	Wheat	-0.15
.	MiPit	Pit	0.85
.	MiPit	CotPi	-0.15
.	MiPit	_rhs_	0
Le	MiCPi	.	.
.	MiCPi	PWh	-0.12
.	MiCPi	Pmai	-0.12

.	MiCPi	Pbar	-0.12
.	MiCPi	Maize	-0.12
.	MiCPi	Bar	-0.12
.	MiCPi	Wheat	-0.12
.	MiCPi	Pit	-0.12
.	MiCPi	CotPi	0.88
.	MiCPi	_rhs_	0
Le	MiMai	.	.
.	MiMai	PWh	-0.45
.	MiMai	Pmai	0.55
.	MiMai	Pbar	-0.45
.	MiMai	Maize	0.55
.	MiMai	Bar	-0.45
.	MiMai	Wheat	-0.45
.	MiMai	Pit	-0.45
.	MiMai	CotPi	-0.45
.	MiMai	_rhs_	0
Le	MJF	.	.
.	MJF	PWh	-13.3
.	MJF	Pmai	-13.6
.	MJF	Pclov	-8.4
.	MJF	Pbar	-13.3
.	MJF	Sil	-9.8
.	MJF	Clov	-8.4
.	MJF	Straw	-11.2
.	MJF	Maize	-13.6
.	MJF	Bar	-13.3
.	MJF	Wheat	-13.3
.	MJF	Pit	-13.7
.	MJF	CotPi	-13.2
.	MJF	Gr	-7.5
.	MJF	MJ	1
.	MJF	_rhs_	0
Le	ERDPF	.	.
.	ERDPF	PWh	-59
.	ERDPF	Pmai	-33
.	ERDPF	Pclov	-118
.	ERDPF	Pbar	-59
.	ERDPF	Sil	-118
.	ERDPF	Clov	-118
.	ERDPF	Straw	-64
.	ERDPF	Maize	-33

.	ERDPF	Bar	-59
.	ERDPF	Wheat	-59
.	ERDPF	Pit	-104
.	ERDPF	CotPi	-222
.	ERDPF	Gr	-52
.	ERDPF	ERDP	1
.	ERDPF	_rhs_	0
Le	DUPF	.	.
.	DUPF	PWh	-14
.	DUPF	Pmai	-61
.	DUPF	Pclov	-25
.	DUPF	Pbar	-14
.	DUPF	Sil	-25
.	DUPF	Clov	-25
.	DUPF	Straw	-21
.	DUPF	Maize	-61
.	DUPF	Bar	-14
.	DUPF	Wheat	-14
.	DUPF	Pit	-10
.	DUPF	CotPi	-109
.	DUPF	Gr	-33
.	DUPF	DUP	1
.	DUPF	_rhs_	0
Le	VetExp	.	.
.	VetExp	Sheep	-16.8
.	VetExp	VetEx	1
.	VetExp	_rhs_	0
Le	OthExp	.	.
.	OthExp	Sheep	-28.56
.	OthExp	OtExp	1
.	OthExp	_rhs_	0
Le	VCTot	.	.
.	VCTot	Sheep	45.36
.	VCTot	CulWh	65
.	VCTot	CulMai	110
.	VCTot	CulClov	130
.	VCTot	CulBar	70
.	VCTot	Clov	0.16
.	VCTot	Straw	0.04
.	VCTot	Maize	0.22
.	VCTot	Bar	0.22
.	VCTot	Wheat	0.21

.	VCTot	Pit	0.25
.	VCTot	CotPi	0.25
.	VCTot	Sil	0.045
.	VCTot	_rhs_	500000
Le	GM	.	.
.	GM	Sheep	-45.36
.	GM	Pmilk	0.96
.	GM	PLamMeat	5
.	GM	PEweMeat	2.2
.	GM	Ch1	7
.	GM	CulWh	-65
.	GM	CulMai	-110
.	GM	CulClov	-130
.	GM	CulBar	-70
.	GM	Bar	-.22
.	GM	Clov	-0.16
.	GM	CotPi	-.25
.	GM	Maize	-.22
.	GM	Pit	-.25
.	GM	Sil	-.045
.	GM	Straw	-0.04
.	GM	Wheat	-.21
.	GM	_rhs_	5000000

Spreadsheet 1. Assaf (Disease Present)

max	object	.	.
.	object	Sheep	-37.95
.	object	Sheep2	-41.95
.	object	Sheep3	-40.95
.	object	Sheep4	-42.21
.	object	Pmilk	0.7
.	object	Pmilk2	0.7
.	object	Pmilk3	0.7
.	object	Pmilk4	0.7
.	object	PLamMeat	4
.	object	PLamMea2	4
.	object	PLamMea3	4
.	object	PLamMea4	4
.	object	PEweMeat	1.8
.	object	PEweMea2	1.8

.	object	PEweMea3	1.8
.	object	PEweMea4	1.8
.	object	Hlab	-3
.	object	VetEx	0
.	object	OtExp	0
.	object	CulWh	-20
.	object	Bar	-.20
.	object	Clov	-0.15
.	object	CotPi	-.27
.	object	Sil	-.06
.	object	Straw	-0.06
.	object	PWh	0
.	object	DUP	0
.	object	ERDP	0
.	object	MJ	0
Le	NonIrrCr	.	.
.	NonIrrCr	CulWh	1
.	NonIrrCr	_rhs_	150
Le	WheatPr	.	.
.	WheatPr	PWh	1
.	WheatPr	CulWh	-220
.	WheatPr	_rhs_	0
Le	Labor	.	.
.	Labor	Sheep	9.8
.	Labor	Sheep2	10.8
.	Labor	Sheep3	9.8
.	Labor	Sheep4	11.6
.	Labor	CulBar	1.3
.	Labor	Hlab	-1
.	Labor	_rhs_	4200
Le	Hired	.	.
.	Hired	Hlab	1
.	Hired	_rhs_	4200
Le	Myie	.	.
.	Myie	Sheep	-326
.	Myie	Pmilk	1
.	Myie	_rhs_	0
Le	LambMeat	.	.
.	LambMeat	Sheep	-15
.	LambMeat	PLamMeat	1
.	LambMeat	_rhs_	0
Le	EweMeat	.	.

.	EweMeat	Sheep	-5
.	EweMeat	PEweMeat	1
.	EweMeat	_rhs_	0
Le	Myie2	.	.
.	Myie2	Sheep2	-205
.	Myie2	Pmilk2	1
.	Myie2	_rhs_	0
Le	LambMea2	.	.
.	LambMea2	Sheep2	-15
.	LambMea2	PLamMea2	1
.	LambMea2	_rhs_	0
Le	EweMeat2	.	.
.	EweMeat2	Sheep2	-5
.	EweMeat2	PEweMea2	1
.	EweMeat2	_rhs_	0
Le	Myie3	.	.
.	Myie3	Sheep3	-290
.	Myie3	Pmilk3	1
.	Myie3	_rhs_	0
Le	LambMea3	.	.
.	LambMea3	Sheep3	-15
.	LambMea3	PLamMea3	1
.	LambMea3	_rhs_	0
Le	EweMeat3	.	.
.	EweMeat3	Sheep3	-4.9
.	EweMeat3	PEweMea3	1
.	EweMeat3	_rhs_	0
Le	Myie4	.	.
.	Myie4	Sheep4	-263
.	Myie4	Pmilk4	1
.	Myie4	_rhs_	0
Le	LambMea4	.	.
.	LambMea4	Sheep4	-15
.	LambMea4	PLamMea4	1
.	LambMea4	_rhs_	0
Le	EweMeat4	.	.
.	EweMeat4	Sheep4	-4.6
.	EweMeat4	PEweMea4	1
.	EweMeat4	_rhs_	0
Le	MJ	.	.
.	MJ	Sheep	4200
.	MJ	Sheep2	4200

.	MJ	Sheep3	4200
.	MJ	Sheep4	4200
.	MJ	MJ	-1
.	MJ	_rhs_	0
Le	ERDPS	.	.
.	ERDPS	Sheep	58000
.	ERDPS	Sheep2	58000
.	ERDPS	Sheep3	58000
.	ERDPS	Sheep4	58000
.	ERDPS	ERDP	-1
.	ERDPS	_rhs_	0
Le	DUPS	.	.
.	DUPS	Sheep	24520
.	DUPS	Sheep2	24520
.	DUPS	Sheep3	24520
.	DUPS	Sheep4	24520
.	DUPS	DUP	-1
.	DUPS	_rhs_	0
Le	RMIn	.	.
.	RMIn	PWh	-0.8
.	RMIn	Sil	0.2
.	RMIn	Clov	0.2
.	RMIn	Straw	0.2
.	RMIn	Bar	-0.8
.	RMIn	CotPi	-0.8
.	RMIn	_rhs_	0
Le	Rmax	.	.
.	Rmax	PWh	0.5
.	Rmax	Sil	-0.5
.	Rmax	Clov	-0.5
.	Rmax	Straw	-0.5
.	Rmax	Bar	0.5
.	Rmax	CotPi	0.5
.	Rmax	_rhs_	0
Le	MiCPi	.	.
.	MiCPi	PWh	-0.12
.	MiCPi	Bar	-0.12
.	MiCPi	CotPi	0.88
.	MiCPi	_rhs_	0
Le	MJF	.	.
.	MJF	PWh	-13.3
.	MJF	Sil	-9.8

.	MJF	Clov	-8.4
.	MJF	Straw	-11.2
.	MJF	Bar	-13.3
.	MJF	CotPi	-13.2
.	MJF	MJ	1
.	MJF	_rhs_	0
Le	ERDPF	.	.
.	ERDPF	PWh	-59
.	ERDPF	Sil	-118
.	ERDPF	Clov	-118
.	ERDPF	Straw	-64
.	ERDPF	Bar	-59
.	ERDPF	CotPi	-222
.	ERDPF	ERDP	1
.	ERDPF	_rhs_	0
Le	DUPF	.	.
.	DUPF	PWh	-14
.	DUPF	Sil	-25
.	DUPF	Clov	-25
.	DUPF	Straw	-21
.	DUPF	Bar	-14
.	DUPF	CotPi	-109
.	DUPF	DUP	1
.	DUPF	_rhs_	0
Le	VetExp	.	.
.	VetExp	Sheep	-10.6
.	VetExp	Sheep2	-14.6
.	VetExp	Sheep3	-13.6
.	VetExp	Sheep4	-14.86
.	VetExp	VetEx	1
.	VetExp	_rhs_	0
Le	OthExp	.	.
.	OthExp	Sheep	-27.35
.	OthExp	Sheep2	-27.35
.	OthExp	Sheep3	-27.35
.	OthExp	Sheep4	-27.35
.	OthExp	OtExp	1
.	OthExp	_rhs_	0
Le	VCTot	.	.
.	VCTot	Sheep	37.95
.	VCTot	Sheep2	41.95
.	VCTot	Sheep3	40.95

.	VCTot	Sheep4	42.21
.	VCTot	CulWh	20
.	VCTot	Clov	0.15
.	VCTot	Straw	0.06
.	VCTot	Bar	0.2
.	VCTot	CotPi	0.27
.	VCTot	Sil	0.06
.	VCTot	_rhs_	500000
Le	GM	.	.
.	GM	Sheep	-37.95
.	GM	Sheep2	-41.95
.	GM	Sheep3	-40.95
.	GM	Sheep4	-42.21
.	GM	Pmilk	0.7
.	GM	Pmilk2	0.7
.	GM	Pmilk3	0.7
.	GM	Pmilk4	0.7
.	GM	PLamMeat	4
.	GM	PLamMea2	4
.	GM	PLamMea3	4
.	GM	PLamMea4	4
.	GM	PEweMeat	1.8
.	GM	PEweMea2	1.8
.	GM	PEweMea3	1.8
.	GM	PEweMea4	1.8
.	GM	CulWh	-20
.	GM	Bar	-.20
.	GM	Clov	-0.15
.	GM	CotPi	-.27
.	GM	Sil	-.06
.	GM	Straw	-0.06
.	GM	_rhs_	5000000
Le	Sick	.	.
.	Sick	Sheep	0.10
.	Sick	Sheep2	-0.90
.	Sick	Sheep3	0.10
.	Sick	Sheep4	0.10
.	Sick	_rhs_	0
Le	Sick2	.	.
.	Sick2	Sheep	0.43
.	Sick2	Sheep2	0.43
.	Sick2	Sheep3	-0.57

.	Sick2	Sheep4	0.43
.	Sick2	_rhs_	0
Le	Sick3	.	.
.	Sick3	Sheep	0.09
.	Sick3	Sheep2	0.09
.	Sick3	Sheep3	0.09
.	Sick3	Sheep4	-0.91
.	Sick3	_rhs_	0

Spreadsheet 1. Assaf (No Diseases)

max	object	.	.
.	object	Sheep	-37.95
.	object	Pmilk	0.7
.	object	PLamMeat	4
.	object	PEweMeat	1.8
.	object	Hlab	-3
.	object	VetEx	0
.	object	OtExp	0
.	object	CulWh	-20
.	object	Bar	-.20
.	object	Clov	-0.15
.	object	CotPi	-.27
.	object	Sil	-.06
.	object	Straw	-0.06
.	object	PWh	0
.	object	DUP	0
.	object	ERDP	0
.	object	MJ	0
Le	NonIrrCr	.	.
.	NonIrrCr	CulWh	1
.	NonIrrCr	_rhs_	150
Le	WheatPr	.	.
.	WheatPr	PWh	1
.	WheatPr	CulWh	-220
.	WheatPr	_rhs_	0
Le	Labor	.	.
.	Labor	Sheep	9.8
.	Labor	CulBar	1.3
.	Labor	Hlab	-1
.	Labor	_rhs_	4200

Le	Hired	.	.
.	Hired	Hlab	1
.	Hired	_rhs_	4200
Le	Myie	.	.
.	Myie	Sheep	-326
.	Myie	Pmilk	1
.	Myie	_rhs_	0
Le	LambMeat	.	.
.	LambMeat	Sheep	-15
.	LambMeat	PLamMeat	1
.	LambMeat	_rhs_	0
Le	EweMeat	.	.
.	EweMeat	Sheep	-5
.	EweMeat	PEweMeat	1
.	EweMeat	_rhs_	0
Le	MJ	.	.
.	MJ	Sheep	4200
.	MJ	MJ	-1
.	MJ	_rhs_	0
Le	ERDPS	.	.
.	ERDPS	Sheep	58000
.	ERDPS	ERDP	-1
.	ERDPS	_rhs_	0
Le	DUPS	.	.
.	DUPS	Sheep	24520
.	DUPS	DUP	-1
.	DUPS	_rhs_	0
Le	RMIn	.	.
.	RMIn	PWh	-0.8
.	RMIn	Sil	0.2
.	RMIn	Clov	0.2
.	RMIn	Straw	0.2
.	RMIn	Bar	-0.8
.	RMIn	CotPi	-0.8
.	RMIn	_rhs_	0
Le	Rmax	.	.
.	Rmax	PWh	0.5
.	Rmax	Sil	-0.5
.	Rmax	Clov	-0.5
.	Rmax	Straw	-0.5
.	Rmax	Bar	0.5
.	Rmax	CotPi	0.5

.	Rmax	_rhs_	0
Le	MiCPi	.	.
.	MiCPi	PWh	-0.12
.	MiCPi	Bar	-0.12
.	MiCPi	CotPi	0.88
.	MiCPi	_rhs_	0
Le	MJF	.	.
.	MJF	PWh	-13.3
.	MJF	Sil	-9.8
.	MJF	Clov	-8.4
.	MJF	Straw	-11.2
.	MJF	Bar	-13.3
.	MJF	CotPi	-13.2
.	MJF	MJ	1
.	MJF	_rhs_	0
Le	ERDPF	.	.
.	ERDPF	PWh	-59
.	ERDPF	Sil	-118
.	ERDPF	Clov	-118
.	ERDPF	Straw	-64
.	ERDPF	Bar	-59
.	ERDPF	CotPi	-222
.	ERDPF	ERDP	1
.	ERDPF	_rhs_	0
Le	DUPF	.	.
.	DUPF	PWh	-14
.	DUPF	Sil	-25
.	DUPF	Clov	-25
.	DUPF	Straw	-21
.	DUPF	Bar	-14
.	DUPF	CotPi	-109
.	DUPF	DUP	1
.	DUPF	_rhs_	0
Le	VetExp	.	.
.	VetExp	Sheep	-10.6
.	VetExp	VetEx	1
.	VetExp	_rhs_	0
Le	OthExp	.	.
.	OthExp	Sheep	-27.35
.	OthExp	OtExp	1
.	OthExp	_rhs_	0
Le	VCTot	.	.

.	VCTot	Sheep	37.95
.	VCTot	CulWh	20
.	VCTot	Clov	0.15
.	VCTot	Straw	0.06
.	VCTot	Bar	0.2
.	VCTot	CotPi	0.27
.	VCTot	Sil	0.06
.	VCTot	_rhs_	500000
Le	GM	.	.
.	GM	Sheep	-37.95
.	GM	Pmilk	0.7
.	GM	PLamMeat	4
.	GM	PEweMeat	1.8
.	GM	CulWh	-20
.	GM	Bar	-.20
.	GM	Clov	-0.15
.	GM	CotPi	-.27
.	GM	Sil	-.06
.	GM	Straw	-0.06
.	GM	_rhs_	5000000

Spreadsheet 1. Frizarta (Disease Present)

max	object	.	.
.	object	Sheep	-46.5
.	object	Sheep2	-50.5
.	object	Sheep3	-49.5
.	object	Sheep4	-50.76
.	object	Pmilk	0.82
.	object	Pmilk2	0.82
.	object	Pmilk3	0.82
.	object	Pmilk4	0.82
.	object	PLamMeat	3.5
.	object	PLamMea2	3.5
.	object	PLamMea3	3.5
.	object	PLamMea4	3.5
.	object	PEweMeat	1.5
.	object	PEweMea2	1.5
.	object	PEweMea3	1.5
.	object	PEweMea4	1.5
.	object	Hlab	-3

.	object	VetEx	0
.	object	OtExp	0
.	object	CulWh	-18
.	object	CulMai	-35
.	object	CulClov	-23
.	object	CulBar	-18
.	object	Bar	-.20
.	object	Clov	-0.15
.	object	CotPi	-.33
.	object	Straw	-0.10
.	object	Wheat	-.20
.	object	Pbar	0
.	object	Pclov	0
.	object	Pmai	0
.	object	PWh	0
.	object	DUP	0
.	object	ERDP	0
.	object	MJ	0
.	object	Gr	0
.	object	Grass	0
Le	IrrCrop	.	.
.	IrrCrop	CulMai	1
.	IrrCrop	CulClov	1
.	IrrCrop	_rhs_	35
Le	NonIrrCr	.	.
.	NonIrrCr	CulWh	1
.	NonIrrCr	CulBar	1
.	NonIrrCr	_rhs_	5
Le	Graze	.	.
.	Graze	Grass	1
.	Graze	_rhs_	209
Le	WheatPr	.	.
.	WheatPr	PWh	1
.	WheatPr	CulWh	-180
.	WheatPr	_rhs_	0
Le	BarleyPr	.	.
.	BarleyPr	Pbar	1
.	BarleyPr	CulBar	-180
.	BarleyPr	_rhs_	0
Le	CloverPr	.	.
.	CloverPr	Pclov	1
.	CloverPr	CulClov	-1200

.	CloverPr	_rhs_	0
Le	MaizePr	.	.
.	MaizePr	Pmai	1
.	MaizePr	CulMai	-1500
.	MaizePr	_rhs_	0
Le	PrGra	.	.
.	PrGra	Grass	-750
.	PrGra	Gr	1
.	PrGra	_rhs_	0
Le	Labor	.	.
.	Labor	Sheep	15
.	Labor	Sheep2	16
.	Labor	Sheep3	15
.	Labor	Sheep4	16.8
.	Labor	CulBar	1.5
.	Labor	CulWh	1.5
.	Labor	CulMai	3
.	Labor	CulClov	5
.	Labor	Hlab	-1
.	Labor	_rhs_	2100
Le	Hired	.	.
.	Hired	Hlab	1
.	Hired	_rhs_	2100
Le	Myie	.	.
.	Myie	Sheep	-290
.	Myie	Pmilk	1
.	Myie	_rhs_	0
Le	LambMeat	.	.
.	LambMeat	Sheep	-13.5
.	LambMeat	PLamMeat	1
.	LambMeat	_rhs_	0
Le	EweMeat	.	.
.	EweMeat	Sheep	-7.2
.	EweMeat	PEweMeat	1
.	EweMeat	_rhs_	0
Le	Myie2	.	.
.	Myie2	Sheep2	-229
.	Myie2	Pmilk2	1
.	Myie2	_rhs_	0
Le	LambMea2	.	.
.	LambMea2	Sheep2	-13.5
.	LambMea2	PLamMea2	1

.	LambMea2	_rhs_	0
Le	EweMeat2	.	.
.	EweMeat2	Sheep2	-7.2
.	EweMeat2	PEweMea2	1
.	EweMeat2	_rhs_	0
Le	Myie3	.	.
.	Myie3	Sheep3	-226
.	Myie3	Pmilk3	1
.	Myie3	_rhs_	0
Le	LambMea3	.	.
.	LambMea3	Sheep3	-13.5
.	LambMea3	PLamMea3	1
.	LambMea3	_rhs_	0
Le	EweMeat3	.	.
.	EweMeat3	Sheep3	-7.2
.	EweMeat3	PEweMea3	1
.	EweMeat3	_rhs_	0
Le	Myie4	.	.
.	Myie4	Sheep4	-234
.	Myie4	Pmilk4	1
.	Myie4	_rhs_	0
Le	LambMea4	.	.
.	LambMea4	Sheep4	-13.5
.	LambMea4	PLamMea4	1
.	LambMea4	_rhs_	0
Le	EweMeat4	.	.
.	EweMeat4	Sheep4	-6.6
.	EweMeat4	PEweMea4	1
.	EweMeat4	_rhs_	0
Le	MJ	.	.
.	MJ	Sheep	5785
.	MJ	Sheep2	5785
.	MJ	Sheep3	5785
.	MJ	Sheep4	5785
.	MJ	MJ	-1
.	MJ	_rhs_	0
Le	ERDPS	.	.
.	ERDPS	Sheep	59310
.	ERDPS	Sheep2	59310
.	ERDPS	Sheep3	59310
.	ERDPS	Sheep4	59310
.	ERDPS	ERDP	-1

.	ERDPS	_rhs_	0
Le	DUPS	.	.
.	DUPS	Sheep	24768
.	DUPS	Sheep2	24768
.	DUPS	Sheep3	24768
.	DUPS	Sheep4	24768
.	DUPS	DUP	-1
.	DUPS	_rhs_	0
Le	RMIn	.	.
.	RMIn	PWh	-0.8
.	RMIn	Pmai	-0.8
.	RMIn	Pclov	0.2
.	RMIn	Pbar	-0.8
.	RMIn	Clov	0.2
.	RMIn	Straw	0.2
.	RMIn	Bar	-0.8
.	RMIn	Wheat	-0.8
.	RMIn	CotPi	-0.8
.	RMIn	Gr	0.2
.	RMIn	_rhs_	0
Le	Rmax	.	.
.	Rmax	PWh	0.5
.	Rmax	Pmai	0.5
.	Rmax	Pclov	-0.5
.	Rmax	Pbar	0.5
.	Rmax	Clov	-0.5
.	Rmax	Straw	-0.5
.	Rmax	Bar	0.5
.	Rmax	Wheat	0.5
.	Rmax	CotPi	0.5
.	Rmax	Gr	-0.5
.	Rmax	_rhs_	0
Le	MiCPi	.	.
.	MiCPi	PWh	-0.12
.	MiCPi	Pmai	-0.12
.	MiCPi	Pbar	-0.12
.	MiCPi	Bar	-0.12
.	MiCPi	Wheat	-0.12
.	MiCPi	CotPi	0.88
.	MiCPi	_rhs_	0
Le	MiMai	.	.
.	MiMai	PWh	-0.45

.	MiMai	Pmai	0.55
.	MiMai	Pbar	-0.45
.	MiMai	Bar	-0.45
.	MiMai	Wheat	-0.45
.	MiMai	CotPi	-0.45
.	MiMai	_rhs_	0
Le	MJF	.	.
.	MJF	PWh	-13.3
.	MJF	Pmai	-13.6
.	MJF	Pclov	-8.4
.	MJF	Pbar	-13.3
.	MJF	Clov	-8.4
.	MJF	Straw	-11.2
.	MJF	Bar	-13.3
.	MJF	Wheat	-13.3
.	MJF	CotPi	-13.2
.	MJF	Gr	-7.5
.	MJF	MJ	1
.	MJF	_rhs_	0
Le	ERDPF	.	.
.	ERDPF	PWh	-59
.	ERDPF	Pmai	-33
.	ERDPF	Pclov	-118
.	ERDPF	Pbar	-59
.	ERDPF	Clov	-118
.	ERDPF	Straw	-64
.	ERDPF	Bar	-59
.	ERDPF	Wheat	-59
.	ERDPF	CotPi	-222
.	ERDPF	Gr	-52
.	ERDPF	ERDP	1
.	ERDPF	_rhs_	0
Le	DUPF	.	.
.	DUPF	PWh	-14
.	DUPF	Pmai	-61
.	DUPF	Pclov	-25
.	DUPF	Pbar	-14
.	DUPF	Clov	-25
.	DUPF	Straw	-21
.	DUPF	Bar	-14
.	DUPF	Wheat	-14
.	DUPF	CotPi	-109

.	DUPF	Gr	-33
.	DUPF	DUP	1
.	DUPF	_rhs_	0
Le	VetExp	.	.
.	VetExp	Sheep	-8.5
.	VetExp	Sheep2	-12.5
.	VetExp	Sheep3	-11.5
.	VetExp	Sheep4	-12.76
.	VetExp	VetEx	1
.	VetExp	_rhs_	0
Le	OthExp	.	.
.	OthExp	Sheep	-38
.	OthExp	Sheep2	-38
.	OthExp	Sheep3	-38
.	OthExp	Sheep4	-38
.	OthExp	OtExp	1
.	OthExp	_rhs_	0
Le	VCTot	.	.
.	VCTot	Sheep	46.5
.	VCTot	Sheep2	50.5
.	VCTot	Sheep3	49.5
.	VCTot	Sheep4	50.76
.	VCTot	CulWh	18
.	VCTot	CulMai	35
.	VCTot	CulClov	23
.	VCTot	CulBar	18
.	VCTot	Clov	0.15
.	VCTot	Straw	0.1
.	VCTot	Bar	0.2
.	VCTot	Wheat	0.2
.	VCTot	CotPi	0.33
.	VCTot	_rhs_	500000
Le	GM	.	.
.	GM	Sheep	-46.5
.	GM	Sheep2	-50.5
.	GM	Sheep3	-49.5
.	GM	Sheep4	-50.76
.	GM	Pmilk	0.82
.	GM	Pmilk2	0.82
.	GM	Pmilk3	0.82
.	GM	Pmilk4	0.82
.	GM	PLamMeat	3.5

.	GM	PLamMea2	3.5
.	GM	PLamMea3	3.5
.	GM	PLamMea4	3.5
.	GM	PEweMeat	1.5
.	GM	PEweMea2	1.5
.	GM	PEweMea3	1.5
.	GM	PEweMea4	1.5
.	GM	CulWh	-18
.	GM	CulMai	-35
.	GM	CulClov	-23
.	GM	CulBar	-18
.	GM	Bar	-.20
.	GM	Clov	-0.15
.	GM	CotPi	-.33
.	GM	Straw	-0.10
.	GM	Wheat	-.20
.	GM	_rhs_	5000000
Le	Sick	.	.
.	Sick	Sheep	0.20
.	Sick	Sheep2	-0.80
.	Sick	Sheep3	0.20
.	Sick	Sheep4	0.20
.	Sick	_rhs_	0
Le	Sick2	.	.
.	Sick2	Sheep	0.35
.	Sick2	Sheep2	0.35
.	Sick2	Sheep3	-0.65
.	Sick2	Sheep4	0.35
.	Sick2	_rhs_	0
Le	Sick3	.	.
.	Sick3	Sheep	0.09
.	Sick3	Sheep2	0.09
.	Sick3	Sheep3	0.09
.	Sick3	Sheep4	-0.93
.	Sick3	_rhs_	0

Spreadsheet 1. Frizarta (No Diseases)

max	object	.	.
.	object	Sheep	-46.5
.	object	Pmilk	0.82

.	object	PLamMeat	3.5
.	object	PEweMeat	1.5
.	object	Hlab	-3
.	object	VetEx	0
.	object	OtExp	0
.	object	CulWh	-18
.	object	CulMai	-35
.	object	CulClov	-23
.	object	CulBar	-18
.	object	Bar	-.20
.	object	Clov	-0.15
.	object	CotPi	-.33
.	object	Straw	-0.10
.	object	Wheat	-.20
.	object	Pbar	0
.	object	Pclov	0
.	object	Pmai	0
.	object	PWh	0
.	object	DUP	0
.	object	ERDP	0
.	object	MJ	0
.	object	Gr	0
.	object	Grass	0
Le	IrrCrop	.	.
.	IrrCrop	CulMai	1
.	IrrCrop	CulClov	1
.	IrrCrop	_rhs_	35
Le	NonIrrCr	.	.
.	NonIrrCr	CulWh	1
.	NonIrrCr	CulBar	1
.	NonIrrCr	_rhs_	5
Le	Graze	.	.
.	Graze	Grass	1
.	Graze	_rhs_	209
Le	WheatPr	.	.
.	WheatPr	PWh	1
.	WheatPr	CulWh	-180
.	WheatPr	_rhs_	0
Le	BarleyPr	.	.
.	BarleyPr	Pbar	1
.	BarleyPr	CulBar	-180
.	BarleyPr	_rhs_	0

Le	CloverPr	.	.
.	CloverPr	Pclov	1
.	CloverPr	CulClov	-1200
.	CloverPr	_rhs_	0
Le	MaizePr	.	.
.	MaizePr	Pmai	1
.	MaizePr	CulMai	-1500
.	MaizePr	_rhs_	0
Le	PrGra	.	.
.	PrGra	Grass	-750
.	PrGra	Gr	1
.	PrGra	_rhs_	0
Le	Labor	.	.
.	Labor	Sheep	15
.	Labor	CulBar	1.5
.	Labor	CulWh	1.5
.	Labor	CulMai	3
.	Labor	CulClov	5
.	Labor	Hlab	-1
.	Labor	_rhs_	2100
Le	Hired	.	.
.	Hired	Hlab	1
.	Hired	_rhs_	2100
Le	Myie	.	.
.	Myie	Sheep	-290
.	Myie	Pmilk	1
.	Myie	_rhs_	0
Le	LambMeat	.	.
.	LambMeat	Sheep	-13.5
.	LambMeat	PLamMeat	1
.	LambMeat	_rhs_	0
Le	EweMeat	.	.
.	EweMeat	Sheep	-7.2
.	EweMeat	PEweMeat	1
.	EweMeat	_rhs_	0
Le	MJ	.	.
.	MJ	Sheep	5785
.	MJ	MJ	-1
.	MJ	_rhs_	0
Le	ERDPS	.	.
.	ERDPS	Sheep	59310
.	ERDPS	ERDP	-1

.	ERDPS	_rhs_	0
Le	DUPS	.	.
.	DUPS	Sheep	24768
.	DUPS	DUP	-1
.	DUPS	_rhs_	0
Le	RMIn	.	.
.	RMIn	PWh	-0.8
.	RMIn	Pmai	-0.8
.	RMIn	Pclov	0.2
.	RMIn	Pbar	-0.8
.	RMIn	Clov	0.2
.	RMIn	Straw	0.2
.	RMIn	Bar	-0.8
.	RMIn	Wheat	-0.8
.	RMIn	CotPi	-0.8
.	RMIn	Gr	0.2
.	RMIn	_rhs_	0
Le	Rmax	.	.
.	Rmax	PWh	0.5
.	Rmax	Pmai	0.5
.	Rmax	Pclov	-0.5
.	Rmax	Pbar	0.5
.	Rmax	Clov	-0.5
.	Rmax	Straw	-0.5
.	Rmax	Bar	0.5
.	Rmax	Wheat	0.5
.	Rmax	CotPi	0.5
.	Rmax	Gr	-0.5
.	Rmax	_rhs_	0
Le	MiCPi	.	.
.	MiCPi	PWh	-0.12
.	MiCPi	Pmai	-0.12
.	MiCPi	Pbar	-0.12
.	MiCPi	Bar	-0.12
.	MiCPi	Wheat	-0.12
.	MiCPi	CotPi	0.88
.	MiCPi	_rhs_	0
Le	MiMai	.	.
.	MiMai	PWh	-0.45
.	MiMai	Pmai	0.55
.	MiMai	Pbar	-0.45
.	MiMai	Bar	-0.45

.	MiMai	Wheat	-0.45
.	MiMai	CotPi	-0.45
.	MiMai	_rhs_	0
Le	MJF	.	.
.	MJF	PWh	-13.3
.	MJF	Pmai	-13.6
.	MJF	Pclov	-8.4
.	MJF	Pbar	-13.3
.	MJF	Clov	-8.4
.	MJF	Straw	-11.2
.	MJF	Bar	-13.3
.	MJF	Wheat	-13.3
.	MJF	CotPi	-13.2
.	MJF	Gr	-7.5
.	MJF	MJ	1
.	MJF	_rhs_	0
Le	ERDPF	.	.
.	ERDPF	PWh	-59
.	ERDPF	Pmai	-33
.	ERDPF	Pclov	-118
.	ERDPF	Pbar	-59
.	ERDPF	Clov	-118
.	ERDPF	Straw	-64
.	ERDPF	Bar	-59
.	ERDPF	Wheat	-59
.	ERDPF	CotPi	-222
.	ERDPF	Gr	-52
.	ERDPF	ERDP	1
.	ERDPF	_rhs_	0
Le	DUPF	.	.
.	DUPF	PWh	-14
.	DUPF	Pmai	-61
.	DUPF	Pclov	-25
.	DUPF	Pbar	-14
.	DUPF	Clov	-25
.	DUPF	Straw	-21
.	DUPF	Bar	-14
.	DUPF	Wheat	-14
.	DUPF	CotPi	-109
.	DUPF	Gr	-33
.	DUPF	DUP	1
.	DUPF	_rhs_	0

Le	VetExp	.	.
.	VetExp	Sheep	-8.5
.	VetExp	VetEx	1
.	VetExp	_rhs_	0
Le	OthExp	.	.
.	OthExp	Sheep	-38
.	OthExp	OtExp	1
.	OthExp	_rhs_	0
Le	VCTot	.	.
.	VCTot	Sheep	46.5
.	VCTot	CulWh	18
.	VCTot	CulMai	35
.	VCTot	CulClov	23
.	VCTot	CulBar	18
.	VCTot	Clov	0.15
.	VCTot	Straw	0.1
.	VCTot	Bar	0.2
.	VCTot	Wheat	0.2
.	VCTot	CotPi	0.33
.	VCTot	_rhs_	500000
Le	GM	.	.
.	GM	Sheep	-46.5
.	GM	Pmilk	0.82
.	GM	PLamMeat	3.5
.	GM	PEweMeat	1.5
.	GM	CulWh	-18
.	GM	CulMai	-35
.	GM	CulClov	-23
.	GM	CulBar	-18
.	GM	Bar	-.20
.	GM	Clov	-0.15
.	GM	CotPi	-.33
.	GM	Straw	-0.10
.	GM	Wheat	-.20
.	GM	_rhs_	5000000

Spreadsheet 1. Boutsiko (Diseases Present)

max	object	.	.
.	object	Sheep	-18.87
.	object	Sheep2	-22.87

.	object	Sheep3	-21.87
.	object	Sheep4	-23.13
.	object	Pmilk	0.93
.	object	Pmilk2	0.93
.	object	Pmilk3	0.93
.	object	Pmilk4	0.93
.	object	PLamMeat	6.08
.	object	PLamMea2	6.08
.	object	PLamMea3	6.08
.	object	PLamMea4	6.08
.	object	PEweMeat	2.81
.	object	PEweMea2	2.81
.	object	PEweMea3	2.81
.	object	PEweMea4	2.81
.	object	Hlab	-3
.	object	VetEx	0
.	object	OtExp	0
.	object	Bar	-0.18
.	object	Clov	-0.2
.	object	Maize	-0.23
.	object	Straw	-0.05
.	object	DUP	0
.	object	ERDP	0
.	object	MJ	0
.	object	Gr	0
.	object	Grass	0
Ge	Graze	.	.
.	Graze	Grass	1
.	Graze	_rhs_	480
Le	PrGra	.	.
.	PrGra	Grass	-858
.	PrGra	Gr	1
.	PrGra	_rhs_	0
Le	Labor	.	.
.	Labor	Sheep	36.2
.	Labor	Sheep2	37.2
.	Labor	Sheep3	36.2
.	Labor	Sheep4	37.99
.	Labor	Hlab	-1
.	Labor	_rhs_	3150
Le	Hired	.	.
.	Hired	Hlab	1

.	Hired	_rhs_	2100
Le	Myie	.	.
.	Myie	Sheep	-84
.	Myie	Pmilk	1
.	Myie	_rhs_	0
Le	LambMeat	.	.
.	LambMeat	Sheep	-5.65
.	LambMeat	PLamMeat	1
.	LambMeat	_rhs_	0
Le	EweMeat	.	.
.	EweMeat	Sheep	-2.18
.	EweMeat	PEweMeat	1
.	EweMeat	_rhs_	0
Le	Myie2	.	.
.	Myie2	Sheep2	-47.79
.	Myie2	Pmilk2	1
.	Myie2	_rhs_	0
Le	LambMea2	.	.
.	LambMea2	Sheep2	-5.65
.	LambMea2	PLamMea2	1
.	LambMea2	_rhs_	0
Le	EweMeat2	.	.
.	EweMeat2	Sheep2	-2.18
.	EweMeat2	PEweMea2	1
.	EweMeat2	_rhs_	0
Le	Myie3	.	.
.	Myie3	Sheep3	-76.86
.	Myie3	Pmilk3	1
.	Myie3	_rhs_	0
Le	LambMea3	.	.
.	LambMea3	Sheep3	-5.65
.	LambMea3	PLamMea3	1
.	LambMea3	_rhs_	0
Le	EweMeat3	.	.
.	EweMeat3	Sheep3	-2.07
.	EweMeat3	PEweMea3	1
.	EweMeat3	_rhs_	0
Le	Myie4	.	.
.	Myie4	Sheep4	-76.44
.	Myie4	Pmilk4	1
.	Myie4	_rhs_	0
Le	LambMea4	.	.

.	LambMea4	Sheep4	-5.65
.	LambMea4	PLamMea4	1
.	LambMea4	_rhs_	0
Le	EweMeat4	.	.
.	EweMeat4	Sheep4	-2.0
.	EweMeat4	PEweMea4	1
.	EweMeat4	_rhs_	0
Le	MJ	.	.
.	MJ	Sheep	3119
.	MJ	Sheep2	3119
.	MJ	Sheep3	3119
.	MJ	Sheep4	3119
.	MJ	MJ	-1
.	MJ	_rhs_	0
Le	ERDPS	.	.
.	ERDPS	Sheep	23608
.	ERDPS	Sheep2	23608
.	ERDPS	Sheep3	23608
.	ERDPS	Sheep4	23608
.	ERDPS	ERDP	-1
.	ERDPS	_rhs_	0
Le	DUPS	.	.
.	DUPS	Sheep	1978
.	DUPS	Sheep2	1978
.	DUPS	Sheep3	1978
.	DUPS	Sheep4	1978
.	DUPS	DUP	-1
.	DUPS	_rhs_	0
Le	RMIn	.	.
.	RMIn	Clov	0.2
.	RMIn	Straw	0.2
.	RMIn	Maize	-0.8
.	RMIn	Bar	-0.8
.	RMIn	Gr	0.2
.	RMIn	_rhs_	0
Le	Rmax	.	.
.	Rmax	Clov	-0.5
.	Rmax	Straw	-0.5
.	Rmax	Maize	0.5
.	Rmax	Bar	0.5
.	Rmax	Gr	-0.5
.	Rmax	_rhs_	0

Le	MiMai	.	.
.	MiMai	Maize	0.55
.	MiMai	Bar	-0.45
.	MiMai	_rhs_	0
Le	MJF	.	.
.	MJF	Clov	-8.4
.	MJF	Straw	-11.2
.	MJF	Maize	-13.6
.	MJF	Bar	-13.3
.	MJF	Gr	-7.5
.	MJF	MJ	1
.	MJF	_rhs_	0
Le	ERDPF	.	.
.	ERDPF	Clov	-118
.	ERDPF	Straw	-64
.	ERDPF	Maize	-33
.	ERDPF	Bar	-59
.	ERDPF	Gr	-52
.	ERDPF	ERDP	1
.	ERDPF	_rhs_	0
Le	DUPF	.	.
.	DUPF	Clov	-25
.	DUPF	Straw	-21
.	DUPF	Maize	-61
.	DUPF	Bar	-14
.	DUPF	Gr	-33
.	DUPF	DUP	1
.	DUPF	_rhs_	0
Le	VetExp	.	.
.	VetExp	Sheep	-6.05
.	VetExp	Sheep2	-10.05
.	VetExp	Sheep3	-9.05
.	VetExp	Sheep4	-10.31
.	VetExp	VetEx	1
.	VetExp	_rhs_	0
Le	OthExp	.	.
.	OthExp	Sheep	-12.82
.	OthExp	Sheep2	-12.82
.	OthExp	Sheep3	-12.82
.	OthExp	Sheep4	-12.82
.	OthExp	OtExp	1
.	OthExp	_rhs_	0

Le	VCTot	.	.
.	VCTot	Sheep	18.82
.	VCTot	Sheep2	22.87
.	VCTot	Sheep3	21.87
.	VCTot	Sheep4	23.13
.	VCTot	Clov	0.2
.	VCTot	Straw	0.05
.	VCTot	Maize	0.21
.	VCTot	Bar	0.18
.	VCTot	_rhs_	500000
Le	GM	.	.
.	GM	Sheep	-18.87
.	GM	Sheep2	-22.87
.	GM	Sheep3	-21.87
.	GM	Sheep4	-23.13
.	GM	Pmilk	0.93
.	GM	Pmilk2	0.93
.	GM	Pmilk3	0.93
.	GM	Pmilk4	0.93
.	GM	PLamMeat	6.08
.	GM	PLamMea2	6.08
.	GM	PLamMea3	6.08
.	GM	PLamMea4	6.08
.	GM	PEweMeat	2.81
.	GM	PEweMea2	2.81
.	GM	PEweMea3	2.81
.	GM	PEweMea4	2.81
.	GM	Bar	-0.18
.	GM	Clov	-0.2
.	GM	Maize	-0.21
.	GM	Straw	-0.05
.	GM	_rhs_	5000000
Le	Sick	.	.
.	Sick	Sheep	0.27
.	Sick	Sheep2	-0.73
.	Sick	Sheep3	0.27
.	Sick	Sheep4	0.27
.	Sick	_rhs_	0
Le	Sick2	.	.
.	Sick2	Sheep	0.47
.	Sick2	Sheep2	0.47
.	Sick2	Sheep3	-0.53

.	Sick2	Sheep4	0.47
.	Sick2	_rhs_	0
Le	Sick3	.	.
.	Sick3	Sheep	0.09
.	Sick3	Sheep2	0.09
.	Sick3	Sheep3	0.09
.	Sick3	Sheep4	-0.91
.	Sick3	_rhs_	0

Spreadsheet 1. Boutsiko (No Diseases)

max	object	.	.
.	object	Sheep	-18.87
.	object	Pmilk	0.93
.	object	PLamMeat	6.08
.	object	PEweMeat	2.81
.	object	Hlab	-3
.	object	VetEx	0
.	object	OtExp	0
.	object	Bar	-0.18
.	object	Clov	-0.2
.	object	Maize	-0.23
.	object	Straw	-0.05
.	object	DUP	0
.	object	ERDP	0
.	object	MJ	0
.	object	Gr	0
.	object	Grass	0
Ge	Graze	.	.
.	Graze	Grass	1
.	Graze	_rhs_	480
Le	PrGra	.	.
.	PrGra	Grass	-858
.	PrGra	Gr	1
.	PrGra	_rhs_	0
Le	Labor	.	.
.	Labor	Sheep	36.2
.	Labor	Hlab	-1
.	Labor	_rhs_	3150
Le	Hired	.	.
.	Hired	Hlab	1

.	Hired	_rhs_	2100
Le	Myie	.	.
.	Myie	Sheep	-84
.	Myie	Pmilk	1
.	Myie	_rhs_	0
Le	LambMeat	.	.
.	LambMeat	Sheep	-5.65
.	LambMeat	PLamMeat	1
.	LambMeat	_rhs_	0
Le	EweMeat	.	.
.	EweMeat	Sheep	-2.18
.	EweMeat	PEweMeat	1
.	EweMeat	_rhs_	0
Le	MJ	.	.
.	MJ	Sheep	3119
.	MJ	MJ	-1
.	MJ	_rhs_	0
Le	ERDPS	.	.
.	ERDPS	Sheep	23608
.	ERDPS	ERDP	-1
.	ERDPS	_rhs_	0
Le	DUPS	.	.
.	DUPS	Sheep	1978
.	DUPS	DUP	-1
.	DUPS	_rhs_	0
Le	RMIn	.	.
.	RMIn	Clov	0.2
.	RMIn	Straw	0.2
.	RMIn	Maize	-0.8
.	RMIn	Bar	-0.8
.	RMIn	Gr	0.2
.	RMIn	_rhs_	0
Le	Rmax	.	.
.	Rmax	Clov	-0.5
.	Rmax	Straw	-0.5
.	Rmax	Maize	0.5
.	Rmax	Bar	0.5
.	Rmax	Gr	-0.5
.	Rmax	_rhs_	0
Le	MiMai	.	.
.	MiMai	Maize	0.55
.	MiMai	Bar	-0.45

.	MiMai	_rhs_	0
Le	MJF	.	.
.	MJF	Clov	-8.4
.	MJF	Straw	-11.2
.	MJF	Maize	-13.6
.	MJF	Bar	-13.3
.	MJF	Gr	-7.5
.	MJF	MJ	1
.	MJF	_rhs_	0
Le	ERDPF	.	.
.	ERDPF	Clov	-118
.	ERDPF	Straw	-64
.	ERDPF	Maize	-33
.	ERDPF	Bar	-59
.	ERDPF	Gr	-52
.	ERDPF	ERDP	1
.	ERDPF	_rhs_	0
Le	DUPF	.	.
.	DUPF	Clov	-25
.	DUPF	Straw	-21
.	DUPF	Maize	-61
.	DUPF	Bar	-14
.	DUPF	Gr	-33
.	DUPF	DUP	1
.	DUPF	_rhs_	0
Le	VetExp	.	.
.	VetExp	Sheep	-6.05
.	VetExp	VetEx	1
.	VetExp	_rhs_	0
Le	OthExp	.	.
.	OthExp	Sheep	-12.82
.	OthExp	OtExp	1
.	OthExp	_rhs_	0
Le	VCTot	.	.
.	VCTot	Sheep	18.82
.	VCTot	Clov	0.2
.	VCTot	Straw	0.05
.	VCTot	Maize	0.21
.	VCTot	Bar	0.18
.	VCTot	_rhs_	500000
Le	GM	.	.
.	GM	Sheep	-18.87

.	GM	Pmilk	0.93
.	GM	PLamMeat	6.08
.	GM	PEweMeat	2.81
.	GM	Bar	-0.18
.	GM	Clov	-0.2
.	GM	Maize	-0.21
.	GM	Straw	-0.05
.	GM	_rhs_	5000000

Spreadsheet 1. Lacaune (Diseases Present).

max	object	.	.
.	object	Sheep	-53
.	object	Sheep2	-56
.	object	Sheep3	-58
.	object	Pmilk	0.92
.	object	Pmilk2	0.92
.	object	Pmilk3	0.92
.	object	PLamMeat	4.03
.	object	PLamMea2	4.03
.	object	PLamMea3	4.03
.	object	PEweMeat	2.26
.	object	PEweMea2	2.26
.	object	PEweMea3	2.26
.	object	Hlab	-9
.	object	VetEx	0
.	object	OtExp	0
.	object	CulClov	-525
.	object	CulBar	-350
.	object	CotPi	-.44
.	object	Pbar	0
.	object	Pclov	0
.	object	DUP	0
.	object	ERDP	0
.	object	MJ	0
.	object	Gr	0
.	object	Grass	0
Le	IrrCrop	.	.
.	IrrCrop	CulClov	1
.	IrrCrop	_rhs_	32
Le	NonIrrCr	.	.
.	NonIrrCr	CulBar	1

.	NonIrrCr	_rhs_	12
Le	Graze	.	.
.	Graze	Grass	1
.	Graze	_rhs_	26
Le	BarleyPr	.	.
.	BarleyPr	Pbar	1
.	BarleyPr	CulBar	-5365
.	BarleyPr	_rhs_	0
Le	CloverPr	.	.
.	CloverPr	Pclov	1
.	CloverPr	CulClov	-12000
.	CloverPr	_rhs_	0
Le	PrGra	.	.
.	PrGra	Grass	-7363
.	PrGra	Gr	1
.	PrGra	_rhs_	0
Le	Labor	.	.
.	Labor	Sheep	8.75
.	Labor	Sheep2	9
.	Labor	Sheep3	8.83
.	Labor	CulBar	15
.	Labor	CulClov	50
.	Labor	Hlab	-1
.	Labor	_rhs_	3500
Le	Myie	.	.
.	Myie	Sheep	-325
.	Myie	Pmilk	1
.	Myie	_rhs_	0
Le	LambMeat	.	.
.	LambMeat	Sheep	-14.5
.	LambMeat	PLamMeat	1
.	LambMeat	_rhs_	0
Le	EweMeat	.	.
.	EweMeat	Sheep	-7.3
.	EweMeat	PEweMeat	1
.	EweMeat	_rhs_	0
Le	Myie2	.	.
.	Myie2	Sheep2	-293
.	Myie2	Pmilk2	1
.	Myie2	_rhs_	0
Le	LambMea2	.	.
.	LambMea2	Sheep2	-14.5

.	LambMea2	PLamMea2	1
.	LambMea2	_rhs_	0
Le	EweMeat2	.	.
.	EweMeat2	Sheep2	-7.3
.	EweMeat2	PEweMea2	1
.	EweMeat2	_rhs_	0
Le	Myie3	.	.
.	Myie3	Sheep3	-293
.	Myie3	Pmilk3	1
.	Myie3	_rhs_	0
Le	LambMea3	.	.
.	LambMea3	Sheep3	-14.5
.	LambMea3	PLamMea3	1
.	LambMea3	_rhs_	0
Le	EweMeat3	.	.
.	EweMeat3	Sheep3	-7.3
.	EweMeat3	PEweMea3	1
.	EweMeat3	_rhs_	0
Le	MJ	.	.
.	MJ	Sheep	4800
.	MJ	Sheep2	4800
.	MJ	Sheep3	4800
.	MJ	MJ	-1
.	MJ	_rhs_	0
Le	ERDPS	.	.
.	ERDPS	Sheep	52910
.	ERDPS	Sheep2	52910
.	ERDPS	Sheep3	52910
.	ERDPS	ERDP	-1
.	ERDPS	_rhs_	0
Le	DUPS	.	.
.	DUPS	Sheep	22852
.	DUPS	Sheep2	22852
.	DUPS	Sheep3	22852
.	DUPS	DUP	-1
.	DUPS	_rhs_	0
Le	RMIn	.	.
.	RMIn	Pclov	0.2
.	RMIn	Pbar	-0.8
.	RMIn	CotPi	-0.8
.	RMIn	Gr	0.2
.	RMIn	_rhs_	0

Le	Rmax	.	.
.	Rmax	Pclov	-0.5
.	Rmax	Pbar	0.5
.	Rmax	CotPi	0.5
.	Rmax	Gr	-0.5
.	Rmax	_rhs_	0
Le	MiCPi	.	.
.	MiCPi	Pbar	-0.12
.	MiCPi	CotPi	0.88
.	MiCPi	_rhs_	0
Le	MJF	.	.
.	MJF	Pclov	-8.4
.	MJF	Pbar	-13.3
.	MJF	CotPi	-13.2
.	MJF	Gr	-7.5
.	MJF	MJ	1
.	MJF	_rhs_	0
Le	ERDPF	.	.
.	ERDPF	Pclov	-118
.	ERDPF	Pbar	-59
.	ERDPF	CotPi	-222
.	ERDPF	Gr	-52
.	ERDPF	ERDP	1
.	ERDPF	_rhs_	0
Le	DUPF	.	.
.	DUPF	Pclov	-25
.	DUPF	Pbar	-14
.	DUPF	CotPi	-109
.	DUPF	Gr	-33
.	DUPF	DUP	1
.	DUPF	_rhs_	0
Le	VetExp	.	.
.	VetExp	Sheep	-8.25
.	VetExp	Sheep2	-11.25
.	VetExp	Sheep3	-13.25
.	VetExp	VetEx	1
.	VetExp	_rhs_	0
Le	OthExp	.	.
.	OthExp	Sheep	-44.75
.	OthExp	Sheep2	-44.75
.	OthExp	Sheep3	-44.75
.	OthExp	OtExp	1

.	OthExp	_rhs_	0
Le	VCTot	.	.
.	VCTot	Sheep	53
.	VCTot	Sheep2	56
.	VCTot	Sheep3	58
.	VCTot	CulClov	525
.	VCTot	CulBar	350
.	VCTot	CotPi	0.44
.	VCTot	_rhs_	500000
Le	GM	.	.
.	GM	Sheep	-53
.	GM	Sheep2	-56
.	GM	Sheep3	-58
.	GM	Pmilk	0.92
.	GM	Pmilk2	0.92
.	GM	Pmilk3	0.92
.	GM	PLamMeat	4.03
.	GM	PLamMea2	4.03
.	GM	PLamMea3	4.03
.	GM	PEweMeat	2.26
.	GM	PEweMea2	2.26
.	GM	PEweMea3	2.26
.	GM	CulClov	-525
.	GM	CulBar	-350
.	GM	CotPi	-.44
.	GM	_rhs_	5000000
Le	Sick	.	.
.	Sick	Sheep	0.22
.	Sick	Sheep2	-0.78
.	Sick	Sheep3	0.22
.	Sick	_rhs_	0
Le	Sick2	.	.
.	Sick2	Sheep	0.10
.	Sick2	Sheep2	0.10
.	Sick2	Sheep3	-0.90
.	Sick2	_rhs_	0

Spreadsheet 1. Lacaune (No Diseases)

max	object	.	.
.	object	Sheep	-53
.	object	Pmilk	0.92

.	object	PLamMeat	4.03
.	object	PEweMeat	2.26
.	object	Hlab	-9
.	object	VetEx	0
.	object	OtExp	0
.	object	CulClov	-525
.	object	CulBar	-350
.	object	CotPi	-.44
.	object	Pbar	0
.	object	Pclov	0
.	object	DUP	0
.	object	ERDP	0
.	object	MJ	0
.	object	Gr	0
.	object	Grass	0
Le	IrrCrop	.	.
.	IrrCrop	CulClov	1
.	IrrCrop	_rhs_	32
Le	NonIrrCr	.	.
.	NonIrrCr	CulBar	1
.	NonIrrCr	_rhs_	12
Le	Graze	.	.
.	Graze	Grass	1
.	Graze	_rhs_	26
Le	BarleyPr	.	.
.	BarleyPr	Pbar	1
.	BarleyPr	CulBar	-5365
.	BarleyPr	_rhs_	0
Le	CloverPr	.	.
.	CloverPr	Pclov	1
.	CloverPr	CulClov	-12000
.	CloverPr	_rhs_	0
Le	PrGra	.	.
.	PrGra	Grass	-7363
.	PrGra	Gr	1
.	PrGra	_rhs_	0
Le	Labor	.	.
.	Labor	Sheep	8.75
.	Labor	CulBar	15
.	Labor	CulClov	50
.	Labor	Hlab	-1
.	Labor	_rhs_	3500

Le	Myie	.	.
.	Myie	Sheep	-325
.	Myie	Pmilk	1
.	Myie	_rhs_	0
Le	LambMeat	.	.
.	LambMeat	Sheep	-14.5
.	LambMeat	PLamMeat	1
.	LambMeat	_rhs_	0
Le	EweMeat	.	.
.	EweMeat	Sheep	-7.3
.	EweMeat	PEweMeat	1
.	EweMeat	_rhs_	0
Le	MJ	.	.
.	MJ	Sheep	4800
.	MJ	MJ	-1
.	MJ	_rhs_	0
Le	ERDPS	.	.
.	ERDPS	Sheep	52910
.	ERDPS	ERDP	-1
.	ERDPS	_rhs_	0
Le	DUPS	.	.
.	DUPS	Sheep	22852
.	DUPS	DUP	-1
.	DUPS	_rhs_	0
Le	RMIn	.	.
.	RMIn	Pclov	0.2
.	RMIn	Pbar	-0.8
.	RMIn	CotPi	-0.8
.	RMIn	Gr	0.2
.	RMIn	_rhs_	0
Le	Rmax	.	.
.	Rmax	Pclov	-0.5
.	Rmax	Pbar	0.5
.	Rmax	CotPi	0.5
.	Rmax	Gr	-0.5
.	Rmax	_rhs_	0
Le	MiCPi	.	.
.	MiCPi	Pbar	-0.12
.	MiCPi	CotPi	0.88
.	MiCPi	_rhs_	0
Le	MJF	.	.
.	MJF	Pclov	-8.4

.	MJF	Pbar	-13.3
.	MJF	CotPi	-13.2
.	MJF	Gr	-7.5
.	MJF	MJ	1
.	MJF	_rhs_	0
Le	ERDPF	.	.
.	ERDPF	Pclov	-118
.	ERDPF	Pbar	-59
.	ERDPF	CotPi	-222
.	ERDPF	Gr	-52
.	ERDPF	ERDP	1
.	ERDPF	_rhs_	0
Le	DUPF	.	.
.	DUPF	Pclov	-25
.	DUPF	Pbar	-14
.	DUPF	CotPi	-109
.	DUPF	Gr	-33
.	DUPF	DUP	1
.	DUPF	_rhs_	0
Le	VetExp	.	.
.	VetExp	Sheep	-8.25
.	VetExp	VetEx	1
.	VetExp	_rhs_	0
Le	OthExp	.	.
.	OthExp	Sheep	-44.75
.	OthExp	OtExp	1
.	OthExp	_rhs_	0
Le	VCTot	.	.
.	VCTot	Sheep	53
.	VCTot	CulClov	525
.	VCTot	CulBar	350
.	VCTot	CotPi	0.44
.	VCTot	_rhs_	500000
Le	GM	.	.
.	GM	Sheep	-53
.	GM	Pmilk	0.92
.	GM	PLamMeat	4.03
.	GM	PEweMeat	2.26
.	GM	CulClov	-525
.	GM	CulBar	-350
.	GM	CotPi	-.44
.	GM	_rhs_	5000000

Spreadsheet 1. Skopelos (Diseases Present)

max	object	.	.
.	object	Sheep	-20.4
.	object	Sheep2	-24.4
.	object	Sheep3	-24.9
.	object	Sheep4	-24.66
.	object	Pmilk	0.518
.	object	Pmilk2	0.518
.	object	Pmilk3	0.518
.	object	Pmilk4	0.518
.	object	PLamMeat	4.28
.	object	PLamMea2	4.28
.	object	PLamMea3	4.28
.	object	PLamMea4	4.28
.	object	PEweMeat	1.31
.	object	PEweMea2	1.31
.	object	PEweMea3	1.31
.	object	PEweMea4	1.31
.	object	Ch1	4.2
.	object	Ch2	4.2
.	object	Ch3	4.2
.	object	Ch4	4.2
.	object	Hlab	-3
.	object	VetEx	0
.	object	OtExp	0
.	object	CulWh	-75
.	object	CulMai	-110
.	object	CulClov	-116
.	object	CulBar	-70
.	object	Bar	-0.21
.	object	Clov	-0.18
.	object	CotPi	-0.26
.	object	Maize	-0.21
.	object	Pit	-0.24
.	object	Sil	-0.19
.	object	Straw	-0.06
.	object	Wheat	-0.21
.	object	Milk	0
.	object	Milk2	0
.	object	Milk3	0

.	object	Milk4	0
.	object	Pbar	0
.	object	Pclov	0
.	object	Pmai	0
.	object	PWh	0
.	object	DUP	0
.	object	ERDP	0
.	object	MJ	0
.	object	Gr	0
.	object	Grass	0
Le	IrrCrop	.	.
.	IrrCrop	CulMai	1
.	IrrCrop	CulClov	1
.	IrrCrop	_rhs_	59
Le	NonIrrCr	.	.
.	NonIrrCr	CulWh	1
.	NonIrrCr	CulBar	1
.	NonIrrCr	_rhs_	30
Le	Graze	.	.
.	Graze	Grass	1
.	Graze	_rhs_	256
Le	WheatPr	.	.
.	WheatPr	PWh	1
.	WheatPr	CulWh	-268
.	WheatPr	_rhs_	0
Le	BarleyPr	.	.
.	BarleyPr	Pbar	1
.	BarleyPr	CulBar	-265
.	BarleyPr	_rhs_	0
Le	CloverPr	.	.
.	CloverPr	Pclov	1
.	CloverPr	CulClov	-1350
.	CloverPr	_rhs_	0
Le	MaizePr	.	.
.	MaizePr	Pmai	1
.	MaizePr	CulMai	-1060
.	MaizePr	_rhs_	0
Le	PrGra	.	.
.	PrGra	Grass	-736.41
.	PrGra	Gr	1
.	PrGra	_rhs_	0
Le	Labor	.	.

.	Labor	Sheep	20
.	Labor	Sheep2	21
.	Labor	Sheep3	20
.	Labor	Sheep4	21.8
.	Labor	Ch1	0.1
.	Labor	Ch2	0.1
.	Labor	Ch3	0.1
.	Labor	Ch4	0.1
.	Labor	CulBar	1.3
.	Labor	CulWh	1.25
.	Labor	CulMai	2.9
.	Labor	CulClov	10
.	Labor	Hlab	-1
.	Labor	_rhs_	4625
Le	Hired	.	.
.	Hired	Hlab	1
.	Hired	_rhs_	4200
Le	Myie	.	.
.	Myie	Sheep	-144
.	Myie	Milk	1
.	Myie	_rhs_	0
Le	Msale	.	.
.	Msale	Pmilk	1
.	Msale	Ch1	4.2
.	Msale	Milk	-1
.	Msale	_rhs_	0
Le	Cheese	.	.
.	Cheese	Pmilk	-0.2
.	Cheese	Ch1	2.1
.	Cheese	_rhs_	0
Le	LambMeat	.	.
.	LambMeat	Sheep	-5.5
.	LambMeat	PLamMeat	1
.	LambMeat	_rhs_	0
Le	EweMeat	.	.
.	EweMeat	Sheep	-1.14
.	EweMeat	PEweMeat	1
.	EweMeat	_rhs_	0
Le	Myie2	.	.
.	Myie2	Sheep2	-122.4
.	Myie2	Milk2	1
.	Myie2	_rhs_	0

Le	Msale2	.	.
.	Msale2	Pmilk2	1
.	Msale2	Ch2	34800
.	Msale2	Milk2	-1
.	Msale2	_rhs_	0
Le	Cheese2	.	.
.	Cheese2	Pmilk2	-0.2
.	Cheese2	Ch2	2.1
.	Cheese2	_rhs_	0
Le	LambMea2	.	.
.	LambMea2	Sheep2	-5.5
.	LambMea2	PLamMea2	1
.	LambMea2	_rhs_	0
Le	EweMeat2	.	.
.	EweMeat2	Sheep2	-1.14
.	EweMeat2	PEweMea2	1
.	EweMeat2	_rhs_	0
Le	Myie3	.	.
.	Myie3	Sheep3	-136
.	Myie3	Milk3	1
.	Myie3	_rhs_	0
Le	Msale3	.	.
.	Msale3	Pmilk3	1
.	Msale3	Ch3	4.2
.	Msale3	Milk3	-1
.	Msale3	_rhs_	0
Le	Cheese3	.	.
.	Cheese3	Pmilk3	-0.2
.	Cheese3	Ch3	2.1
.	Cheese3	_rhs_	0
Le	LambMea3	.	.
.	LambMea3	Sheep3	-5.5
.	LambMea3	PLamMea3	1
.	LambMea3	_rhs_	0
Le	EweMeat3	.	.
.	EweMeat3	Sheep3	-1.14
.	EweMeat3	PEweMea3	1
.	EweMeat3	_rhs_	0
Le	Myie4	.	.
.	Myie4	Sheep4	-116
.	Myie4	Milk4	1
.	Myie4	_rhs_	0

Le	Msale4	.	.
.	Msale4	Pmilk4	1
.	Msale4	Ch4	4.2
.	Msale4	Milk4	-1
.	Msale4	_rhs_	0
Le	Cheese4	.	.
.	Cheese4	Pmilk4	-0.2
.	Cheese4	Ch4	2.1
.	Cheese4	_rhs_	0
Le	LambMea4	.	.
.	LambMea4	Sheep4	-5.5
.	LambMea4	PLamMea4	1
.	LambMea4	_rhs_	0
Le	EweMeat4	.	.
.	EweMeat4	Sheep4	-1.05
.	EweMeat4	PEweMea4	1
.	EweMeat4	_rhs_	0
Le	MJ	.	.
.	MJ	Sheep	3780
.	MJ	Sheep2	3780
.	MJ	Sheep3	3780
.	MJ	Sheep4	3780
.	MJ	MJ	-1
.	MJ	_rhs_	0
Le	ERDPS	.	.
.	ERDPS	Sheep	33264
.	ERDPS	Sheep2	33264
.	ERDPS	Sheep3	33264
.	ERDPS	Sheep4	33264
.	ERDPS	ERDP	-1
.	ERDPS	_rhs_	0
Le	DUPS	.	.
.	DUPS	Sheep	2397
.	DUPS	Sheep2	2397
.	DUPS	Sheep3	2397
.	DUPS	Sheep4	2397
.	DUPS	DUP	-1
.	DUPS	_rhs_	0
Le	RMIn	.	.
.	RMIn	PWh	-0.8
.	RMIn	Pmai	-0.8
.	RMIn	Pclov	0.2

.	RMIn	Pbar	-0.8
.	RMIn	Sil	0.2
.	RMIn	Clov	0.2
.	RMIn	Straw	0.2
.	RMIn	Maize	-0.8
.	RMIn	Bar	-0.8
.	RMIn	Wheat	-0.8
.	RMIn	Pit	-0.8
.	RMIn	CotPi	-0.8
.	RMIn	Gr	0.2
.	RMIn	_rhs_	0
Le	Rmax	.	.
.	Rmax	PWh	0.5
.	Rmax	Pmai	0.5
.	Rmax	Pclov	-0.5
.	Rmax	Pbar	0.5
.	Rmax	Sil	-0.5
.	Rmax	Clov	-0.5
.	Rmax	Straw	-0.5
.	Rmax	Maize	0.5
.	Rmax	Bar	0.5
.	Rmax	Wheat	0.5
.	Rmax	Pit	0.5
.	Rmax	CotPi	0.5
.	Rmax	Gr	-0.5
.	Rmax	_rhs_	0
Le	MiPit	.	.
.	MiPit	PWh	-0.15
.	MiPit	Pmai	-0.15
.	MiPit	Pbar	-0.15
.	MiPit	Maize	-0.15
.	MiPit	Bar	-0.15
.	MiPit	Wheat	-0.15
.	MiPit	Pit	0.85
.	MiPit	CotPi	-0.15
.	MiPit	_rhs_	0
Le	MiCPi	.	.
.	MiCPi	PWh	-0.12
.	MiCPi	Pmai	-0.12
.	MiCPi	Pbar	-0.12
.	MiCPi	Maize	-0.12
.	MiCPi	Bar	-0.12

.	MiCPi	Wheat	-0.12
.	MiCPi	Pit	-0.12
.	MiCPi	CotPi	0.88
.	MiCPi	_rhs_	0
Le	MiMai	.	.
.	MiMai	PWh	-0.45
.	MiMai	Pmai	0.55
.	MiMai	Pbar	-0.45
.	MiMai	Maize	0.55
.	MiMai	Bar	-0.45
.	MiMai	Wheat	-0.45
.	MiMai	Pit	-0.45
.	MiMai	CotPi	-0.45
.	MiMai	_rhs_	0
Le	MJF	.	.
.	MJF	PWh	-13.3
.	MJF	Pmai	-13.6
.	MJF	Pclov	-8.4
.	MJF	Pbar	-13.3
.	MJF	Sil	-9.8
.	MJF	Clov	-8.4
.	MJF	Straw	-11.2
.	MJF	Maize	-13.6
.	MJF	Bar	-13.3
.	MJF	Wheat	-13.3
.	MJF	Pit	-13.7
.	MJF	CotPi	-13.2
.	MJF	Gr	-7.5
.	MJF	MJ	1
.	MJF	_rhs_	0
Le	ERDPF	.	.
.	ERDPF	PWh	-59
.	ERDPF	Pmai	-33
.	ERDPF	Pclov	-118
.	ERDPF	Pbar	-59
.	ERDPF	Sil	-118
.	ERDPF	Clov	-118
.	ERDPF	Straw	-64
.	ERDPF	Maize	-33
.	ERDPF	Bar	-59
.	ERDPF	Wheat	-59
.	ERDPF	Pit	-104

.	ERDPF	CotPi	-222
.	ERDPF	Gr	-52
.	ERDPF	ERDP	1
.	ERDPF	_rhs_	0
Le	DUPF	.	.
.	DUPF	PWh	-14
.	DUPF	Pmai	-61
.	DUPF	Pclov	-25
.	DUPF	Pbar	-14
.	DUPF	Sil	-25
.	DUPF	Clov	-25
.	DUPF	Straw	-21
.	DUPF	Maize	-61
.	DUPF	Bar	-14
.	DUPF	Wheat	-14
.	DUPF	Pit	-10
.	DUPF	CotPi	-109
.	DUPF	Gr	-33
.	DUPF	DUP	1
.	DUPF	_rhs_	0
Le	VetExp	.	.
.	VetExp	Sheep	-5.6
.	VetExp	Sheep2	-9.6
.	VetExp	Sheep3	10.1
.	VetExp	Sheep4	-9.86
.	VetExp	VetEx	1
.	VetExp	_rhs_	0
Le	OthExp	.	.
.	OthExp	Sheep	-14.8
.	OthExp	Sheep2	-14.8
.	OthExp	Sheep3	-14.8
.	OthExp	Sheep4	-14.8
.	OthExp	OtExp	1
.	OthExp	_rhs_	0
Le	VCTot	.	.
.	VCTot	Sheep	20.4
.	VCTot	Sheep2	24.4
.	VCTot	Sheep3	24.9
.	VCTot	Sheep4	24.66
.	VCTot	CulWh	75
.	VCTot	CulMai	110
.	VCTot	CulClov	116

.	VCTot	CulBar	70
.	VCTot	Clov	0.18
.	VCTot	Straw	0.06
.	VCTot	Maize	0.21
.	VCTot	Bar	0.21
.	VCTot	Wheat	0.21
.	VCTot	Pit	0.24
.	VCTot	CotPi	0.26
.	VCTot	Sil	0.19
.	VCTot	_rhs_	500000
Le	GM	.	.
.	GM	Sheep	-20.4
.	GM	Sheep2	-24.4
.	GM	Sheep3	-24.9
.	GM	Sheep4	-24.66
.	GM	Pmilk	0.518
.	GM	Pmilk2	0.518
.	GM	Pmilk3	0.518
.	GM	Pmilk4	0.518
.	GM	PLamMeat	4.28
.	GM	PLamMea2	4.28
.	GM	PLamMea3	4.28
.	GM	PLamMea4	4.28
.	GM	PEweMeat	1.31
.	GM	PEweMea2	1.31
.	GM	PEweMea3	1.31
.	GM	PEweMea4	1.31
.	GM	Ch1	4.2
.	GM	Ch2	4.2
.	GM	Ch3	4.2
.	GM	Ch4	4.2
.	GM	CulWh	-75
.	GM	CulMai	-110
.	GM	CulClov	-116
.	GM	CulBar	-70
.	GM	Bar	-0.21
.	GM	Clov	-0.18
.	GM	CotPi	-0.26
.	GM	Maize	-0.21
.	GM	Pit	-0.24
.	GM	Sil	-0.19
.	GM	Straw	-0.06

.	GM	Wheat	-0.21
.	GM	_rhs_	5000000
Le	Sick	.	.
.	Sick	Sheep	0.24
.	Sick	Sheep2	-0.76
.	Sick	Sheep3	0.24
.	Sick	Sheep4	0.24
.	Sick	_rhs_	0
Le	Sick2	.	.
.	Sick2	Sheep	0.12
.	Sick2	Sheep2	0.12
.	Sick2	Sheep3	-0.88
.	Sick2	Sheep4	0.12
.	Sick2	_rhs_	0
Le	Sick3	.	.
.	Sick3	Sheep	0.09
.	Sick3	Sheep2	0.09
.	Sick3	Sheep3	0.09
.	Sick3	Sheep4	-0.91
.	Sick3	_rhs_	0

Spreadsheet 1. Skopelos (No Diseases)

max	object	.	.
.	object	Sheep	-20.4
.	object	Pmilk	0.518
.	object	PLamMeat	4.28
.	object	PEweMeat	1.31
.	object	Ch1	4.2
.	object	Hlab	-3
.	object	VetEx	0
.	object	OtExp	0
.	object	CulWh	-75
.	object	CulMai	-110
.	object	CulClov	-116
.	object	CulBar	-70
.	object	Bar	-0.21
.	object	Clov	-0.18
.	object	CotPi	-0.26
.	object	Maize	-0.21
.	object	Pit	-0.24
.	object	Sil	-0.19

.	object	Straw	-0.06
.	object	Wheat	-0.21
.	object	Milk	0
.	object	Pbar	0
.	object	Pclov	0
.	object	Pmai	0
.	object	PWh	0
.	object	DUP	0
.	object	ERDP	0
.	object	MJ	0
.	object	Gr	0
.	object	Grass	0
Le	IrrCrop	.	.
.	IrrCrop	CulMai	1
.	IrrCrop	CulClov	1
.	IrrCrop	_rhs_	59
Le	NonIrrCr	.	.
.	NonIrrCr	CulWh	1
.	NonIrrCr	CulBar	1
.	NonIrrCr	_rhs_	30
Le	Graze	.	.
.	Graze	Grass	1
.	Graze	_rhs_	256
Le	WheatPr	.	.
.	WheatPr	PWh	1
.	WheatPr	CulWh	-268
.	WheatPr	_rhs_	0
Le	BarleyPr	.	.
.	BarleyPr	Pbar	1
.	BarleyPr	CulBar	-265
.	BarleyPr	_rhs_	0
Le	CloverPr	.	.
.	CloverPr	Pclov	1
.	CloverPr	CulClov	-1350
.	CloverPr	_rhs_	0
Le	MaizePr	.	.
.	MaizePr	Pmai	1
.	MaizePr	CulMai	-1060
.	MaizePr	_rhs_	0
Le	PrGra	.	.
.	PrGra	Grass	-736.41
.	PrGra	Gr	1

.	PrGra	_rhs_	0
Le	Labor	.	.
.	Labor	Sheep	20
.	Labor	Ch1	0.1
.	Labor	CulBar	1.3
.	Labor	CulWh	1.25
.	Labor	CulMai	2.9
.	Labor	CulClov	10
.	Labor	Hlab	-1
.	Labor	_rhs_	4625
Le	Hired	.	.
.	Hired	Hlab	1
.	Hired	_rhs_	4200
Le	Myie	.	.
.	Myie	Sheep	-144
.	Myie	Milk	1
.	Myie	_rhs_	0
Le	Msale	.	.
.	Msale	Pmilk	1
.	Msale	Ch1	4.2
.	Msale	Milk	-1
.	Msale	_rhs_	0
Le	Cheese	.	.
.	Cheese	Pmilk	-0.2
.	Cheese	Ch1	2.1
.	Cheese	_rhs_	0
Le	LambMeat	.	.
.	LambMeat	Sheep	-5.5
.	LambMeat	PLamMeat	1
.	LambMeat	_rhs_	0
Le	EweMeat	.	.
.	EweMeat	Sheep	-1.14
.	EweMeat	PEweMeat	1
.	EweMeat	_rhs_	0
Le	MJ	.	.
.	MJ	Sheep	3780
.	MJ	MJ	-1
.	MJ	_rhs_	0
Le	ERDPS	.	.
.	ERDPS	Sheep	33264
.	ERDPS	ERDP	-1
.	ERDPS	_rhs_	0

Le	DUPS	.	.
.	DUPS	Sheep	2397
.	DUPS	DUP	-1
.	DUPS	_rhs_	0
Le	RMIn	.	.
.	RMIn	PWh	-0.8
.	RMIn	Pmai	-0.8
.	RMIn	Pclov	0.2
.	RMIn	Pbar	-0.8
.	RMIn	Sil	0.2
.	RMIn	Clov	0.2
.	RMIn	Straw	0.2
.	RMIn	Maize	-0.8
.	RMIn	Bar	-0.8
.	RMIn	Wheat	-0.8
.	RMIn	Pit	-0.8
.	RMIn	CotPi	-0.8
.	RMIn	Gr	0.2
.	RMIn	_rhs_	0
Le	Rmax	.	.
.	Rmax	PWh	0.5
.	Rmax	Pmai	0.5
.	Rmax	Pclov	-0.5
.	Rmax	Pbar	0.5
.	Rmax	Sil	-0.5
.	Rmax	Clov	-0.5
.	Rmax	Straw	-0.5
.	Rmax	Maize	0.5
.	Rmax	Bar	0.5
.	Rmax	Wheat	0.5
.	Rmax	Pit	0.5
.	Rmax	CotPi	0.5
.	Rmax	Gr	-0.5
.	Rmax	_rhs_	0
Le	MiPit	.	.
.	MiPit	PWh	-0.15
.	MiPit	Pmai	-0.15
.	MiPit	Pbar	-0.15
.	MiPit	Maize	-0.15
.	MiPit	Bar	-0.15
.	MiPit	Wheat	-0.15
.	MiPit	Pit	0.85

.	MiPit	CotPi	-0.15
.	MiPit	_rhs_	0
Le	MiCPi	.	.
.	MiCPi	PWh	-0.12
.	MiCPi	Pmai	-0.12
.	MiCPi	Pbar	-0.12
.	MiCPi	Maize	-0.12
.	MiCPi	Bar	-0.12
.	MiCPi	Wheat	-0.12
.	MiCPi	Pit	-0.12
.	MiCPi	CotPi	0.88
.	MiCPi	_rhs_	0
Le	MiMai	.	.
.	MiMai	PWh	-0.45
.	MiMai	Pmai	0.55
.	MiMai	Pbar	-0.45
.	MiMai	Maize	0.55
.	MiMai	Bar	-0.45
.	MiMai	Wheat	-0.45
.	MiMai	Pit	-0.45
.	MiMai	CotPi	-0.45
.	MiMai	_rhs_	0
Le	MJF	.	.
.	MJF	PWh	-13.3
.	MJF	Pmai	-13.6
.	MJF	Pclov	-8.4
.	MJF	Pbar	-13.3
.	MJF	Sil	-9.8
.	MJF	Clov	-8.4
.	MJF	Straw	-11.2
.	MJF	Maize	-13.6
.	MJF	Bar	-13.3
.	MJF	Wheat	-13.3
.	MJF	Pit	-13.7
.	MJF	CotPi	-13.2
.	MJF	Gr	-7.5
.	MJF	MJ	1
.	MJF	_rhs_	0
Le	ERDPF	.	.
.	ERDPF	PWh	-59
.	ERDPF	Pmai	-33
.	ERDPF	Pclov	-118

.	ERDPF	Pbar	-59
.	ERDPF	Sil	-118
.	ERDPF	Clov	-118
.	ERDPF	Straw	-64
.	ERDPF	Maize	-33
.	ERDPF	Bar	-59
.	ERDPF	Wheat	-59
.	ERDPF	Pit	-104
.	ERDPF	CotPi	-222
.	ERDPF	Gr	-52
.	ERDPF	ERDP	1
.	ERDPF	_rhs_	0
Le	DUPF	.	.
.	DUPF	PWh	-14
.	DUPF	Pmai	-61
.	DUPF	Pclov	-25
.	DUPF	Pbar	-14
.	DUPF	Sil	-25
.	DUPF	Clov	-25
.	DUPF	Straw	-21
.	DUPF	Maize	-61
.	DUPF	Bar	-14
.	DUPF	Wheat	-14
.	DUPF	Pit	-10
.	DUPF	CotPi	-109
.	DUPF	Gr	-33
.	DUPF	DUP	1
.	DUPF	_rhs_	0
Le	VetExp	.	.
.	VetExp	Sheep	-5.6
.	VetExp	VetEx	1
.	VetExp	_rhs_	0
Le	OthExp	.	.
.	OthExp	Sheep	-14.8
.	OthExp	OtExp	1
.	OthExp	_rhs_	0
Le	VCTot	.	.
.	VCTot	Sheep	20.4
.	VCTot	CulWh	75
.	VCTot	CulMai	110
.	VCTot	CulClov	116
.	VCTot	CulBar	70

.	VCTot	Clov	0.18
.	VCTot	Straw	0.06
.	VCTot	Maize	0.21
.	VCTot	Bar	0.21
.	VCTot	Wheat	0.21
.	VCTot	Pit	0.24
.	VCTot	CotPi	0.26
.	VCTot	Sil	0.19
.	VCTot	_rhs_	500000
Le	GM	.	.
.	GM	Sheep	-20.4
.	GM	Pmilk	0.518
.	GM	PLamMeat	4.28
.	GM	PEweMeat	1.31
.	GM	Ch1	4.2
.	GM	CulWh	-75
.	GM	CulMai	-110
.	GM	CulClov	-116
.	GM	CulBar	-70
.	GM	Bar	-0.21
.	GM	Clov	-0.18
.	GM	CotPi	-0.26
.	GM	Maize	-0.21
.	GM	Pit	-0.24
.	GM	Sil	-0.19
.	GM	Straw	-0.06
.	GM	Wheat	-0.21
.	GM	_rhs_	5000000

Speadsheet 2. LP Results (All breeds)

Chios (Diseases Present)

VARIABLE SUMMARY

Col	Name	Price	Activity
1	Bar	0	-0.01
2	Ch1	7	3285.024
3	Ch2	7	712.475
4	Ch3	7	2092.584
5	Ch4	7	432.467
6	Clov	0	-0.115
7	CotPi	-0.25	3710.76
8	CulBar	0	-36.951333
9	CulClov	0	-243.106
10	CulMai	-110	13.127688
11	CulWh	0	-30.452051
12	DUP	0	930037.2458
13	ERDP	0	16663167.32
14	Gr	0	-0.000122
15	Grass	0	0
16	Hlab	-3	2100
17	MJ	0	1627260.984
18	Maize	0	-0.068662
19	Milk	0	38325.285
20	Milk2	0	8312.208
21	Milk3	0	24413.478
22	Milk4	0	5045.452
23	OtExp	0	11067.443
24	PEweMea2	2.2	290.637
25	PEweMea3	2.2	576.429
26	PEweMea4	2.2	124.78
27	PEweMeat	2.2	833.158
28	PLamMea2	5	1133.483
29	PLamMea3	5	2644.793
30	PLamMea4	5	528.959
31	PLamMeat	5	3249.318
32	PWh	0	0
33	Pbar	0	0
34	Pclov	0	0

35	Pit	0	-0.009235
36	Pmai	0	13915.35
37	Pmilk	0.96	26827.699
38	Pmilk2	0.96	5818.546
39	Pmilk3	0.96	17089.434
40	Pmilk4	0.96	3531.816
41	Sheep	-45.36	166.632
42	Sheep2	-49.36	58.127328
43	Sheep3	-48.36	135.63
44	Sheep4	-49.62	27.126086
45	Sil	-0.045	123691.9966
46	Straw	0	-0.031918
47	VetEx	0	7265.218
48	Wheat	-0.21	13296.89
49	IrrCrop	106.872	0
50	NonIrrCr	60	0
51	Graze	800	0
52	WheatPr	-0.21	
53	BarleyPr	-0.21	
54	CloverPr	-0.045	
55	MaizePr	-0.15134	
56	PrGra	0	0
57	Labor	-17.3856	
58	Hired	-14.3856	
59	Myie	-1.12298	
60	Msale	-1.12298	
61	Cheese	-0.54327	
62	LambMeat	-5	
63	EweMeat	-2.2	
64	Myie2	-1.12298	
65	Msale2	-1.12298	
66	Cheese2	-0.54327	
67	LambMea2	-5	
68	EweMeat2	-2.2	
69	Myie3	-1.12298	
70	Msale3	-1.12298	
71	Cheese3	-0.54327	
72	LambMea3	-5	
73	EweMeat3	-2.2	
74	Myie4	-1.12298	
75	Msale4	-1.12298	
76	Cheese4	-0.54327	
77	LambMea4	-5	

78	EweMeat4	-2.2	
79	MJ	154702	0
80	ERDPS	-0.00068	
81	DUPS	0	0
82	RMIn	-0.17837	
83	Rmax	46384.5	0
84	MiPit	4638.45	0
85	MiCPi	-0.07144	
86	MiMai	-0.04089	
87	MJF	0	0
88	ERDPF	-0.00068	
89	DUPF	3601728	0
90	VetExp	0	0
91	OthExp	0	0
92	VCTot	470937.1	0
93	GM	4890470	0
94	Sick	-119.085	
95	Sick2	-60.799	
96	Sick3	-85.8453	

CONSTRAINT SUMMARY

Name	Type	Activity	Activity
1	object	.	
2	IrrCrop	120	13.127688
3	NonIrrCr	60	0
4	Graze	800	0
5	WheatPr	0	0
6	BarleyPr	0	0
7	CloverPr	0	0
8	MaizePr	0	0
9	PrGra	0	0
10	Labor	4200	4200
11	Hired	2100	2100
12	Myie	0	0
13	Msale	0	0
14	Cheese	0	0
15	LambMeat	0	0
16	EweMeat	0	0
17	Myie2	0	0
18	Msale2	0	0
19	Cheese2	0	0

20	LambMea2	0	0
21	EweMeat2	0	0
22	Myie3	0	0
23	Msale3	0	0
24	Cheese3	0	0
25	LambMea3	0	0
26	EweMeat3	0	0
27	Myie4	0	0
28	Msale4	0	0
29	Cheese4	0	0
30	LambMea4	0	0
31	EweMeat4	0	0
32	MJ	0	- 154702.0116
33	ERDPS	0	0
34	DUPS	0	0
35	RMIn	0	0
36	Rmax	0	-46384.499
37	MiPit	0	-4638.45
38	MiCPi	0	0
39	MiMai	0	0
40	MJF	0	0
41	ERDPF	0	0
42	DUPF	0	- 3601728.279
43	VetExp	0	0
44	OthExp	0	0
45	VCTot	500000	29062.884
46	GM	5000000	109529.538
47	Sick	0	0
48	Sick2	0	0
49	Sick3	0	0

Chios (No Diseases)

VARIABLE SUMMARY

Variable Col	Reduced Name	Price	Activity
1	Bar	0	-0.01
2	Ch1	7	7633.836
3	Clov	0	-0.115

4	CotPi	-0.25	3707.964
5	CulBar	0	-40.559091
6	CulClov	0	-270.858
7	CulMai	-110	13.117798
8	CulWh	0	-33.921049
9	DUP	0	929336.5801
10	ERDP	0	16650613.73
11	Gr	0	-0.000541
12	Grass	0	0
13	Hlab	-3	2100
14	MJ	0	1626035.048
15	Maize	0	-0.061069
16	Milk	0	89061.422
17	OtExp	0	11059.105
18	PEweMeat	2.2	1936.118
19	PLamMeat	5	7550.86
20	PWh	0	0
21	Pbar	0	0
22	Pclov	0	0
23	Pit	0	-0.00895
24	Pmai	0	13904.866
25	Pmilk	0.96	62342.996
26	Sheep	-45.36	387.224
27	Sil	-0.045	123598.8103
28	Straw	0	-0.032261
29	VetEx	0	6505.356
30	Wheat	-0.21	13286.872
31	IrrCrop	106.882	0
32	NonIrrCr	60	0
33	Graze	800	0
34	WheatPr	-0.21	
35	BarleyPr	-0.21	
36	CloverPr	-0.045	
37	MaizePr	-0.15893	
38	PrGra	0	0
39	Labor	-20.1608	
40	Hired	-17.1608	
41	Myie	-1.09919	
42	Msale	-1.09919	
43	Cheese	-0.46398	
44	LambMeat	-5	
45	EweMeat	-2.2	
46	MJ	154585.5	0

47	ERDPS	-0.00069	
48	DUPS	0	0
49	RMIn	-0.18211	
50	Rmax	46349.55	0
51	MiPit	4634.955	0
52	MiCPi	-0.07247	
53	MiMai	-0.03313	
54	MJF	0	0
55	ERDPF	-0.00069	
56	DUPF	3599015	0
57	VetExp	0	0
58	OthExp	0	0
59	VCTot	471713.4	0
60	GM	4872987	0

CONSTRAINT SUMMARY

Name	Type	Activity	Activity
1	object	.	
2	IrrCrop	120	13.117798
3	NonIrrCr	60	0
4	Graze	800	0
5	WheatPr	0	0
6	BarleyPr	0	0
7	CloverPr	0	0
8	MaizePr	0	0
9	PrGra	0	0
10	Labor	4200	4200
11	Hired	2100	2100
12	Myie	0	0
13	Msale	0	0
14	Cheese	0	0
15	LambMeat	0	0
16	EweMeat	0	0
17	MJ	0	-154585.4632
18	ERDPS	0	0
19	DUPS	0	0
20	RMIn	0	0
21	Rmax	0	-46349.554
22	MiPit	0	-4634.955
23	MiCPi	0	0
24	MiMai	0	0

25	MJF	0	0
26	ERDPF	0	0
27	DUPF	0	-3599014.832
28	VetExp	0	0
29	OthExp	0	0
30	VCTot	500000	28286.6
31	GM	5000000	127013.2872

Assaf (Diseases Present)

VARIABLE SUMMARY

Variable Col	Reduced Name	Price	Activity
1	Bar	-0.2	110648.3277
2	Clov	0	-0.09
3	CotPi	-0.27	19588.408
4	CulBar	0	-18.873621
5	CulWh	-20	150
6	DUP	0	20469886.7
7	ERDP	0	89871617.41
8	Hlab	-3	4200
9	MJ	0	8567969.803
10	OtExp	0	22832.439
11	PEweMea2	1.8	417.412
12	PEweMea3	1.8	1758.974
13	PEweMea4	1.8	345.617
14	PEweMeat	1.8	1586.166
15	PLamMea2	4	1252.236
16	PLamMea3	4	5384.615
17	PLamMea4	4	1127.013
18	PLamMeat	4	4758.497
19	PWh	0	33000
20	Pmilk	0.7	103418.0084
21	Pmilk2	0.7	17113.894
22	Pmilk3	0.7	104102.5641
23	Pmilk4	0.7	19760.286
24	Sheep	-37.95	317.233
25	Sheep2	-41.95	83.482409
26	Sheep3	-40.95	358.974
27	Sheep4	-42.21	75.134168

28	Sil	-0.06	652946.9443
29	Straw	0	-0.014303
30	VetEx	0	10580.06
31	NonIrrCr	-24	
32	WheatPr	-0.2	
33	Labor	-14.5182	
34	Hired	-11.5182	
35	Myie	-0.7	
36	LambMeat	-4	
37	EweMeat	-1.8	
38	Myie2	-0.7	
39	LambMea2	-4	
40	EweMeat2	-1.8	
41	Myie3	-0.7	
42	LambMea3	-4	
43	EweMeat3	-1.8	
44	Myie4	-0.7	
45	LambMea4	-4	
46	EweMeat4	-1.8	
47	MJ	5061709	0
48	ERDPS	41451820	0
49	DUPS	-0.00358	
50	RMIn	-0.14697	
51	Rmax	244855.1	0
52	MiCPi	-0.2697	
53	MJF	0	0
54	ERDPF	0	0
55	DUPF	-0.00358	
56	VetExp	0	0
57	OthExp	0	0
58	VCTot	396992.1	0
59	GM	4874447	0
60	Sick	-103.218	
61	Sick2	-28.38	
62	Sick3	-75.2127	

CONSTRAINT SUMMARY

Name	Type	Activity	Activity
1	object	.	
2	NonIrrCr	150	150
3	WheatPr	0	0

4	Labor	4200	4200
5	Hired	4200	4200
6	Myie	0	0
7	LambMeat	0	0
8	EweMeat	0	0
9	Myie2	0	0
10	LambMea2	0	0
11	EweMeat2	0	0
12	Myie3	0	0
13	LambMea3	0	0
14	EweMeat3	0	0
15	Myie4	0	0
16	LambMea4	0	0
17	EweMeat4	0	0
18	MJ	0	-5061708.622
19	ERDPS	0	-41451820.15
20	DUPS	0	0
21	RMIn	0	0
22	Rmax	0	-244855.1041
23	MiCPi	0	0
24	MJF	0	0
25	ERDPF	0	0
26	DUPF	0	0
27	VetExp	0	0
28	OthExp	0	0
29	VCTot	500000	103007.851
30	GM	5000000	125552.6261
31	Sick	0	0
32	Sick2	0	0
33	Sick3	0	0

Assaf (No Diseases)

VARIABLE SUMMARY

Variable Col	Reduced Name	Price	Activity
1	Bar	-0.2	114488.72
2	Clov	0	-0.09

3	CotPi	-0.27	20112.10
4	CulBar	0	-22.76
5	CulWh	-20	150.00
6	DUP	0	21017142.86
7	ERDP	0	92274307.59
8	Hlab	-3	4200.00
9	MJ	0	8797031.85
10	OtExp	0	23442.86
11	PEweMeat	1.8	4285.71
12	PLamMeat	4	12857.14
13	PWh	0	33000.00
14	Pmilk	0.7	279428.57
15	Sheep	-37.95	857.14
16	Sil	-0.06	670403.28
17	Straw	0	-0.01
18	VetEx	0	9085.71
19	NonIrrCr	-24	
20	WheatPr	-0.2	
21	Labor	-17.5074	
22	Hired	-14.5074	
23	Myie	-0.7	
24	LambMeat	-4	
25	EweMeat	-1.8	
26	MJ	5197032	0.00
27	ERDPS	42560022	0.00
28	DUPS	-0.00358	
29	RMIn	-0.14697	
30	Rmax	251401.2	0.00
31	MiCPi	-0.2697	
32	MJF	0	0.00
33	ERDPF	0	0.00
34	DUPF	-0.00358	
35	VetExp	0	0.00
36	OthExp	0	0.00
37	VCTot	395919.2	0.00
38	GM	4849338	0.00

CONSTRAINT SUMMARY

Name	Type	Activity	Activity
1	object	.	
2	NonIrrCr	150	150.00

3	WheatPr	0	0.00
4	Labor	4200	4200.00
5	Hired	4200	4200.00
6	Myie	0	0.00
7	LambMeat	0	0.00
8	EweMeat	0	0.00
9	MJ	0	-5197031.85
10	ERDPS	0	-42560021.87
11	DUPS	0	0.00
12	RMIn	0	0.00
13	Rmax	0	-251401.23
14	MiCPi	0	0.00
15	MJF	0	0.00
16	ERDPF	0	0.00
17	DUPF	0	0.00
18	VetExp	0	0.00
19	OthExp	0	0.00
20	VCTot	500000	104080.78
21	GM	5000000	150662.08

Frizarta (Diseases Present)

VARIABLE SUMMARY

Variable Col	Reduced Name	Price	Activity
1	Bar	0	0
2	Clov	-0.15	11387.374
3	CotPi	-0.33	5783.597
4	CulBar	0	0
5	CulClov	-23	20.541006
6	CulMai	-35	14.458994
7	CulWh	-18	5
8	DUP	0	8317218.401
9	ERDP	0	15625744.41
10	Gr	0	156750
11	Grass	0	209
12	Hlab	-3	2100
13	MJ	0	1524109.448
14	OtExp	0	10011.436
15	PEweMea2	1.5	379.381

16	PEweMea3	1.5	663.916
17	PEweMea4	1.5	153.426
18	PEweMeat	1.5	686.233
19	PLamMea2	3.5	711.339
20	PLamMea3	3.5	1244.843
21	PLamMea4	3.5	313.826
22	PLamMeat	3.5	1286.687
23	PWh	0	900
24	Pbar	0	0
25	Pclov	0	24649.208
26	Pmai	0	21688.49
27	Pmilk	0.82	27639.933
28	Pmilk2	0.82	12066.415
29	Pmilk3	0.82	20839.595
30	Pmilk4	0.82	5439.65
31	Sheep	-46.5	95.310113
32	Sheep2	-50.5	52.69177
33	Sheep3	-49.5	92.210598
34	Sheep4	-50.76	23.246369
35	Straw	0	-0.027981
36	VetEx	0	2825.829
37	Wheat	-0.2	19824.558
38	IrrCrop	-115.014	
39	NonIrrCr	-5.40411	
40	Graze	-41.0176	
41	WheatPr	-0.2	
42	BarleyPr	-0.2	
43	CloverPr	-0.15	
44	MaizePr	-0.1168	
45	PrGra	-0.05469	
46	Labor	-8.39726	
47	Hired	-5.39726	
48	Myie	-0.82	
49	LambMeat	-3.5	
50	EweMeat	-1.5	
51	Myie2	-0.82	
52	LambMea2	-3.5	
53	EweMeat2	-1.5	
54	Myie3	-0.82	
55	LambMea3	-3.5	
56	EweMeat3	-1.5	
57	Myie4	-0.82	
58	LambMea4	-3.5	

59	EweMeat4	-1.5	
60	MJ	0	0
61	ERDPS	-0.00144	
62	DUPS	1791870	0
63	RMIn	-0.10201	
64	Rmax	72294.97	0
65	MiCPi	-0.10539	
66	MiMai	-0.04565	
67	MJF	601166.4	0
68	ERDPF	-0.00144	
69	DUPF	0	0
70	VetExp	0	0
71	OthExp	0	0
72	VCTot	478512.6	0
73	GM	4952106	0
74	Sick	-62.4173	
75	Sick2	-55.48	
76	Sick3	-64.8971	

CONSTRAINT	SUMMARY		
Name	Type	Activity	Activity
1	object	.	
2	IrrCrop	35	35
3	NonIrrCr	5	5
4	Graze	209	209
5	WheatPr	0	0
6	BarleyPr	0	0
7	CloverPr	0	0
8	MaizePr	0	0
9	PrGra	0	0
10	Labor	2100	2100
11	Hired	2100	2100
12	Myie	0	0
13	LambMeat	0	0
14	EweMeat	0	0
15	Myie2	0	0
16	LambMea2	0	0
17	EweMeat2	0	0
18	Myie3	0	0
19	LambMea3	0	0
20	EweMeat3	0	0
21	Myie4	0	0

22	LambMea4	0	0
23	EweMeat4	0	0
24	MJ	0	0
25	ERDPS	0	0
26	DUPS	0	- 1791869.599
27	RMIn	0	0
28	Rmax	0	-72294.968
29	MiCPi	0	0
30	MiMai	0	0
31	MJF	0	- 601166.4139
32	ERDPF	0	0
33	DUPF	0	0
34	VetExp	0	0
35	OthExp	0	0
36	VCTot	500000	21487.378
37	GM	5000000	47893.674
38	Sick	0	0
39	Sick2	0	0
40	Sick3	0	0

Frizarta (No Diseases)

VARIABLE SUMMARY

Variable Col	Reduced Name	Price	Activity
1	Bar	0	0
2	Clov	-0.15	14425.16
3	CotPi	-0.33	5867.206
4	CulBar	-18	5
5	CulClov	-23	20.331984
6	CulMai	-35	14.668016
7	CulWh	-18	0
8	DUP	0	8419325.633
9	ERDP	0	16001189.67
10	Gr	0	156750
11	Grass	0	209
12	Hlab	-3	2100
13	MJ	0	1560729.763

14	OtExp	0	10251.985
15	PEweMeat	1.5	1942.481
16	PLamMeat	3.5	3642.152
17	PWh	0	0
18	Pbar	0	900
19	Pclov	0	24398.381
20	Pmai	0	22002.023
21	Pmilk	0.82	78238.83
22	Sheep	-46.5	269.789
23	Straw	0	-0.027829
24	VetEx	0	2293.207
25	Wheat	-0.2	20124.156
26	IrrCrop	-102.377	
27	NonIrrCr	-1.6132	
28	Graze	-41.1569	
29	WheatPr	-0.2	
30	BarleyPr	-0.2	
31	CloverPr	-0.15	
32	MaizePr	-0.11343	
33	PrGra	-0.05488	
34	Labor	-10.9245	
35	Hired	-7.92453	
36	Myie	-0.82	
37	LambMeat	-3.5	
38	EweMeat	-1.5	
39	MJ	0	0
40	ERDPS	-0.00144	
41	DUPS	1737190	0
42	RMIn	-0.10035	
43	Rmax	73340.08	0
44	MiCPi	-0.10493	
45	MiMai	-0.04909	
46	MJF	597308.9	0
47	ERDPF	-0.00144	
48	DUPF	0	0
49	VetExp	0	0
50	OthExp	0	0
51	VCTot	478259	0
52	GM	4941924	0

CONSTRAINT SUMMARY

S/S Dual

Name	Type	Activity	Activity
1	object	.	
2	IrrCrop	35	35
3	NonIrrCr	5	5
4	Graze	209	209
5	WheatPr	0	0
6	BarleyPr	0	0
7	CloverPr	0	0
8	MaizePr	0	0
9	PrGra	0	0
10	Labor	2100	2100
11	Hired	2100	2100
12	Myie	0	0
13	LambMeat	0	0
14	EweMeat	0	0
15	MJ	0	0
16	ERDPS	0	0
17	DUPS	0	-1737189.979
18	RMIn	0	0
19	Rmax	0	-73340.078
20	MiCPi	0	0
21	MiMai	0	0
22	MJF	0	-597308.8999
23	ERDPF	0	0
24	DUPF	0	0
25	VetExp	0	0
26	OthExp	0	0
27	VCTot	500000	21740.991
28	GM	5000000	58076.105

Boutsiko (Diseases Present)

VARIABLE SUMMARY

Variable Col	Reduced Name	Price	Activity
1	Bar	-0.18	7603.412
2	Clov	0	-0.155506
3	DUP	0	170093.1722

4	ERDP	0	2030111.026
5	Gr	0	30413.648
6	Grass	0	480
7	Hlab	0	-1.146327
8	MJ	0	268210.6189
9	Maize	0	-0.067528
10	OtExp	0	1102.424
11	PEweMea2	2.81	50.615188
12	PEweMea3	2.81	83.662107
13	PEweMea4	2.81	15.478651
14	PEweMeat	2.81	31.868822
15	PLamMea2	6.08	131.182
16	PLamMea3	6.08	228.353
17	PLamMea4	6.08	43.727188
18	PLamMeat	6.08	82.5958
19	Pmilk	0.93	1227.973
20	Pmilk2	0.93	1109.587
21	Pmilk3	0.93	3106.41
22	Pmilk4	0.93	591.594
23	Sheep	-18.87	14.618726
24	Sheep2	-22.87	23.217976
25	Sheep3	-21.87	40.416477
26	Sheep4	-23.13	7.739325
27	Straw	0	-0.04191
28	VetEx	0	767.346
29	Graze	0	0
30	PrGra	381426.4	0
31	Labor	-1.85367	
32	Hired	2100	0
33	Myie	-0.93	
34	LambMeat	-6.08	
35	EweMeat	-2.81	
36	Myie2	-0.93	
37	LambMea2	-6.08	
38	EweMeat2	-2.81	
39	Myie3	-0.93	
40	LambMea3	-6.08	
41	EweMeat3	-2.81	
42	Myie4	-0.93	
43	LambMea4	-6.08	
44	EweMeat4	-2.81	
45	MJ	0	0
46	ERDPS	-0.00067	

47	DUPS	0	0
48	RMIn	-0.17528	
49	Rmax	11405.12	0
50	MiMai	3421.535	0
51	MJF	61017.12	0
52	ERDPF	-0.00067	
53	DUPF	940005	0
54	VetExp	0	0
55	OthExp	0	0
56	VCTot	496762.3	0
57	GM	4994161	0
58	Sick	-39.529	
59	Sick2	-9.9493	
60	Sick3	-15.1147	

CONSTRAINT SUMMARY

Name	Type	Activity	Activity
1	object	.	
2	Graze	480	480
3	PrGra	0	- 381426.3517
4	Labor	3150	3150
5	Hired	2100	0
6	Myie	0	0
7	LambMeat	0	0
8	EweMeat	0	0
9	Myie2	0	0
10	LambMea2	0	0
11	EweMeat2	0	0
12	Myie3	0	0
13	LambMea3	0	0
14	EweMeat3	0	0
15	Myie4	0	0
16	LambMea4	0	0
17	EweMeat4	0	0
18	MJ	0	0
19	ERDPS	0	0
20	DUPS	0	0
21	RMIn	0	0
22	Rmax	0	-11405.118
23	MiMai	0	-3421.535
24	MJF	0	-61017.124

25	ERDPF	0	0
26	DUPF	0	-940004.9918
27	VetExp	0	0
28	OthExp	0	0
29	VCTot	500000	3237.653
30	GM	5000000	5839.071
31	Sick	0	0
32	Sick2	0	0
33	Sick3	0	0

Boutsiko (No Diseases)

VARIABLE SUMMARY

Variable Col	Name	Reduced Price	Activity
1	Bar	-0.18	7693.96
2	Clov	0	-0.155506
3	DUP	0	172118.7845
4	ERDP	0	2054287.293
5	Gr	0	30775.84
6	Grass	0	480
7	Hlab	0	-0.684743
8	MJ	0	271404.6961
9	Maize	0	-0.067528
10	OtExp	0	1115.552
11	PEweMeat	2.81	189.696
12	PLamMeat	6.08	491.644
13	Pmilk	0.93	7309.392
14	Sheep	-18.87	87.016575
15	Straw	0	-0.04191
16	VetEx	0	526.45
17	Graze	0	0
18	PrGra	381064.2	0
19	Labor	-2.31526	
20	Hired	2100	0
21	Myie	-0.93	
22	LambMeat	-6.08	
23	EweMeat	-2.81	
24	MJ	0	0
25	ERDPS	-0.00067	

26	DUPS	0	0
27	RMIn	-0.17528	
28	Rmax	11540.94	0
29	MiMai	3462.282	0
30	MJF	61743.77	0
31	ERDPF	-0.00067	
32	DUPF	951199.4	0
33	VetExp	0	0
34	OthExp	0	0
35	VCTot	496977.4	0
36	GM	4992707	0

CONSTRAINT SUMMARY

Name	Type	Activity	Activity
1	object	.	
2	Graze	480	480
3	PrGra	0	- 381064.1604
4	Labor	3150	3150
5	Hired	2100	0
6	Myie	0	0
7	LambMeat	0	0
8	EweMeat	0	0
9	MJ	0	0
10	ERDPS	0	0
11	DUPS	0	0
12	RMIn	0	0
13	Rmax	0	-11540.94
14	MiMai	0	-3462.282
15	MJF	0	-61743.767
16	ERDPF	0	0
17	DUPF	0	- 951199.3606
18	VetExp	0	0
19	OthExp	0	0
20	VCTot	500000	3022.565
21	GM	5000000	7293.059

Lacaune (Diseases Present)

VARIABLE SUMMARY

Variable Col	Reduced Name	Price	Activity
1	CotPi	-0.44	8779.091
2	CulBar	-350	12
3	CulClov	-525	8.433197
4	DUP	0	10705654
5	ERDP	0	27643561.09
6	Gr	0	191438
7	Grass	0	26
8	Hlab	-9	1230.354
9	MJ	0	2248693.296
10	OtExp	0	20964.38
11	PEweMea2	2.26	752.375
12	PEweMea3	2.26	341.989
13	PEweMeat	2.26	2325.524
14	PLamMea2	4.03	1494.444
15	PLamMea3	4.03	679.293
16	PLamMeat	4.03	4619.191
17	Pbar	0	64380
18	Pclov	0	101198.3636
19	Pmilk	0.92	103533.5872
20	Pmilk2	0.92	30198.077
21	Pmilk3	0.92	13726.399
22	Sheep	-53	318.565
23	Sheep2	-56	103.065
24	Sheep3	-58	46.847777
25	VetEx	0	4408.376
26	IrrCrop	23.5668	0
27	NonIrrCr	-4940.98	
28	Graze	-1193.77	
29	BarleyPr	-1.01137	
30	CloverPr	-0.08125	
31	PrGra	-0.16213	
32	Labor	-9	
33	Myie	-0.92	
34	LambMeat	-4.03	
35	EweMeat	-2.26	
36	Myie2	-0.92	
37	LambMea2	-4.03	
38	EweMeat2	-2.26	
39	Myie3	-0.92	

40	LambMea3	-4.03	
41	EweMeat3	-2.26	
42	MJ	0	0
43	ERDPS	2856402	0
44	DUPS	-0.01011	
45	RMIn	-0.85751	
46	Rmax	109738.6	0
47	MiCPi	-1.53182	
48	MJF	1009296	0
49	ERDPF	0	0
50	DUPF	-0.01011	
51	VetExp	0	0
52	OthExp	0	0
53	VCTot	462137	0
54	GM	4867097	0
55	Sick	-34.69	
56	Sick2	-35.16	

CONSTRAINT SUMMARY

Constraint Row	S/S Name	Rhs	Activity
1	object	.	
2	IrrCrop	32	8.433197
3	NonIrrCr	12	12
4	Graze	26	26
5	BarleyPr	0	0
6	CloverPr	0	0
7	PrGra	0	0
8	Labor	3500	3500
9	Myie	0	0
10	LambMeat	0	0
11	EweMeat	0	0
12	Myie2	0	0
13	LambMea2	0	0
14	EweMeat2	0	0
15	Myie3	0	0
16	LambMea3	0	0
17	EweMeat3	0	0
18	MJ	0	0
19	ERDPS	0	-2856402.28
20	DUPS	0	0

21	RMIn	0	0
22	Rmax	0	-109738.6364
23	MiCPi	0	0
24	MJF	0	-1009295.959
25	ERDPF	0	0
26	DUPF	0	0
27	VetExp	0	0
28	OthExp	0	0
29	VCTot	500000	37862.984
30	GM	5000000	132902.8782
31	Sick	0	0
32	Sick2	0	0

Lacaune (No Diseases)

VARIABLE SUMMARY

Variable Col	Reduced Name	Price	Activity
1	CotPi	-0.44	8779.091
2	CulBar	-350	12
3	CulClov	-525	8.433197
4	DUP	0	10705654
5	ERDP	0	27643561.09
6	Gr	0	191438
7	Grass	0	26
8	Hlab	-9	1200.84
9	MJ	0	2248693.296
10	OtExp	0	20964.38
11	PEweMeat	2.26	3419.888
12	PLamMeat	4.03	6792.928
13	Pbar	0	64380
14	Pclov	0	101198.3636
15	Pmilk	0.92	152255.2753
16	Sheep	-53	468.478
17	VetEx	0	3864.942
18	IrrCrop	23.5668	0
19	NonIrrCr	-5313.93	
20	Graze	-1222.5	
21	BarleyPr	-1.08088	

22	CloverPr	-0.08125	
23	PrGra	-0.16603	
24	Labor	-9	
25	Myie	-0.92	
26	LambMeat	-4.03	
27	EweMeat	-2.26	
28	MJ	0	0
29	ERDPS	2856402	0
30	DUPS	-0.0106	
31	RMIn	-0.91849	
32	Rmax	109738.6	0
33	MiCPi	-1.64768	
34	MJF	1009296	0
35	ERDPF	0	0
36	DUPF	-0.0106	
37	VetExp	0	0
38	OthExp	0	0
39	VCTot	462680.4	0
40	GM	4862140	0

CONSTRAINT SUMMARY

Row	Name	Rhs	Activity
1	object	.	
2	IrrCrop	32	8.433197
3	NonIrrCr	12	12
4	Graze	26	26
5	BarleyPr	0	0
6	CloverPr	0	0
7	PrGra	0	0
8	Labor	3500	3500
9	Myie	0	0
10	LambMeat	0	0
11	EweMeat	0	0
12	MJ	0	0
13	ERDPS	0	-2856402.28
14	DUPS	0	0
15	RMIn	0	0
16	Rmax	0	-109738.6364
17	MiCPi	0	0
18	MJF	0	-1009295.959

19	ERDPF	0	0
20	DUPF	0	0
21	VetExp	0	0
22	OthExp	0	0
23	VCTot	500000	37319.55
24	GM	5000000	137859.7478

Skopelos (Diseases Present)

VARIABLE SUMMARY

Variable Col	Name	Reduced Price	Activity
1	Bar	0	0
2	Ch1	4.2	2149.716
3	Ch2	4.2	797.349
4	Ch3	4.2	442.972
5	Ch4	4.2	283.372
6	Clov	0	-0.111277
7	CotPi	-0.26	5655.629
8	CulBar	-70	0
9	CulClov	-116	0
10	CulMai	-110	20.008121
11	CulWh	0	-22.47
12	DUP	0	956403.7845
13	ERDP	0	13272346.89
14	Gr	0	188520.96
15	Grass	0	256
16	Hlab	-3	3940.769
17	MJ	0	1508221.237
18	Maize	0	-0.098019
19	Milk	0	31600.826
20	Milk2	0	11721.034
21	Milk3	0	6511.685
22	Milk4	0	4165.563
23	OtExp	0	5905.205
24	PEweMea2	1.31	109.166
25	PEweMea3	1.31	54.583245
26	PEweMea4	1.31	37.705531
27	PEweMeat	1.31	250.173
28	PLamMea2	4.28	526.68

29	PLamMea3	4.28	263.34
30	PLamMea4	4.28	197.505
31	PLamMeat	4.28	1206.976
32	PWh	0	0
33	Pbar	0	-0.068868
34	Pclov	0	-0.039425
35	Pit	-0.24	7069.536
36	Pmai	0	21208.608
37	Pmilk	0.518	22572.019
38	Pmilk2	0.518	8372.167
39	Pmilk3	0.518	4651.204
40	Pmilk4	0.518	2975.402
41	Sheep	-20.4	219.45
42	Sheep2	-24.4	95.760079
43	Sheep3	-24.9	47.880039
44	Sheep4	-24.66	35.910029
45	Sil	0	-0.121277
46	Straw	0	-0.035941
47	VetEx	0	2018.702
48	Wheat	-0.21	13196.467
49	IrrCrop	38.99188	0
50	NonIrrCr	30	0
51	Graze	-10.4078	
52	WheatPr	-0.21	
53	BarleyPr	-0.27887	
54	CloverPr	-0.10815	
55	MaizePr	-0.11198	
56	PrGra	-0.01413	
57	Labor	-3	
58	Hired	259.231	0
59	Myie	-0.63531	
60	Msale	-0.63531	
61	Cheese	-0.58653	
62	LambMeat	-4.28	
63	EweMeat	-1.31	
64	Myie2	-0.63531	
65	Msale2	-0.63531	
66	Cheese2	-0.58653	
67	LambMea2	-4.28	
68	EweMeat2	-1.31	
69	Myie3	-0.63531	
70	Msale3	-0.63531	
71	Cheese3	-0.58653	

72	LambMea3	-4.28	
73	EweMeat3	-1.31	
74	Myie4	-0.63531	
75	Msale4	-0.63531	
76	Cheese4	-0.58653	
77	LambMea4	-4.28	
78	EweMeat4	-1.31	
79	MJ	0	0
80	ERDPS	-0.00083	
81	DUPS	0	0
82	RMIn	-0.14438	
83	Rmax	70695.36	0
84	MiPit	-0.00722	
85	MiCPi	-0.08482	
86	MiMai	-0.07651	
87	MJF	541143	0
88	ERDPF	-0.00083	
89	DUPF	7430422	0
90	VetExp	0	0
91	OthExp	0	0
92	VCTot	482969.6	0
93	GM	4971638	0
94	Sick	-20.7226	
95	Sick2	-9.58245	
96	Sick3	-27.5665	

CONSTRAINT SUMMARY

Name	Type	Activity	Activity
1	object	.	
2	IrrCrop	59	20.008121
3	NonIrrCr	30	0
4	Graze	256	256
5	WheatPr	0	0
6	BarleyPr	0	0
7	CloverPr	0	0
8	MaizePr	0	0
9	PrGra	0	0
10	Labor	4625	4625
11	Hired	4200	3940.769
12	Myie	0	0
13	Msale	0	0

14	Cheese	0	0
15	LambMeat	0	0
16	EweMeat	0	0
17	Myie2	0	0
18	Msale2	0	0
19	Cheese2	0	0
20	LambMea2	0	0
21	EweMeat2	0	0
22	Myie3	0	0
23	Msale3	0	0
24	Cheese3	0	0
25	LambMea3	0	0
26	EweMeat3	0	0
27	Myie4	0	0
28	Msale4	0	0
29	Cheese4	0	0
30	LambMea4	0	0
31	EweMeat4	0	0
32	MJ	0	0
33	ERDPS	0	0
34	DUPS	0	0
35	RMIn	0	0
36	Rmax	0	-70695.36
37	MiPit	0	0
38	MiCPi	0	0
39	MiMai	0	0
40	MJF	0	- 541142.9888
41	ERDPF	0	0
42	DUPF	0	- 7430422.424
43	VetExp	0	0
44	OthExp	0	0
45	VCTot	500000	17030.387
46	GM	5000000	28361.7
47	Sick	0	0
48	Sick2	0	0
49	Sick3	0	0

Skopelos (No Diseases)

Variable Col	Reduced Name	Price	Activity

1	Bar	0	0
2	Ch1	4.2	3908.575
3	Clov	0	-0.075994
4	CotPi	-0.26	5655.629
5	CulBar	0	-18.25
6	CulClov	-116	0
7	CulMai	-110	20.008121
8	CulWh	0	-22.47
9	DUP	0	956403.7845
10	ERDP	0	13272346.89
11	Gr	0	188520.96
12	Grass	0	256
13	Hlab	-3	3803.888
14	MJ	0	2049364.226
15	Maize	0	-0.098019
16	Milk	0	57456.047
17	OtExp	0	5905.205
18	PEweMeat	1.31	454.86
19	PLamMeat	4.28	2194.502
20	PWh	0	0
21	Pbar	0	0
22	Pclov	0	-0.004143
23	Pit	-0.24	7069.536
24	Pmai	0	21208.608
25	Pmilk	0.518	41040.034
26	Sheep	-20.4	399
27	Sil	0	-0.085994
28	Straw	0	-0.014627
29	VetEx	0	2234.402
30	Wheat	-0.21	13196.467
31	IrrCrop	38.99188	0
32	NonIrrCr	30	0
33	Graze	-23.8184	
34	WheatPr	-0.21	
35	BarleyPr	-0.21	
36	CloverPr	-0.10815	
37	MaizePr	-0.11198	
38	PrGra	-0.03234	
39	Labor	-3	
40	Hired	396.112	0
41	Myie	-0.63531	
42	Msale	-0.63531	
43	Cheese	-0.58653	

44	LambMeat	-4.28	
45	EweMeat	-1.31	
46	MJ	541143	0
47	ERDPS	-0.00109	
48	DUPS	0	0
49	RMIn	-0.12058	
50	Rmax	70695.36	0
51	MiPit	-0.01886	
52	MiCPi	-0.12698	
53	MiMai	-0.06979	
54	MJF	0	0
55	ERDPF	-0.00109	
56	DUPF	7430422	0
57	VetExp	0	0
58	OthExp	0	0
59	VCTot	483721.1	0
60	GM	4968616	0

CONSTRAINT SUMMARY

Name	Type	Activity	Activity
1	object	.	
2	IrrCrop	59	20.008121
3	NonIrrCr	30	0
4	Graze	256	256
5	WheatPr	0	0
6	BarleyPr	0	0
7	CloverPr	0	0
8	MaizePr	0	0
9	PrGra	0	0
10	Labor	4625	4625
11	Hired	4200	3803.888
12	Myie	0	0
13	Msale	0	0
14	Cheese	0	0
15	LambMeat	0	0
16	EweMeat	0	0
17	MJ	0	-541142.9888
18	ERDPS	0	0
19	DUPS	0	0
20	RMIn	0	0
21	Rmax	0	-70695.36

22	MiPit	0	0
23	MiCPi	0	0
24	MiMai	0	0
25	MJF	0	0
26	ERDPF	0	0
27	DUPF	0	- 7430422.424
28	VetExp	0	0
29	OthExp	0	0
30	VCTot	500000	16278.91
31	GM	5000000	31384.175