

The Ecological and Economical Consequences of a Meat Orientated Diet

Consequences discussed in this article:

- Dying of the forests due to over-fertilization and over-acidification because of excessive amounts of excrements from livestock
- Dying of animals living in the ocean due to over-fertilization
- Pollution of ground water due to too much nitrate from livestock excrements
- Increase of the hothouse effect among other things because of methane gas produced in the digestive tract of ruminants
- Waste of big areas of land because they are being used for rearing livestock and cultivation of fodder
- Waste of foodstuff by feeding it to animals for slaughter → senseless extension of the food chain
- Weakening of human health due to over-consumption of animal protein, animal fats and the high amount of toxic substances contained in animal foodstuff.

Worldwide meat production increases further

1994 193.8 million tons of meat were produced. Only for Switzerland, this figure amounts to

Meat production worldwide:	
1990:	170 mio. tons
1993:	190 mio. tons
1994:	194 mio. tons

600'000 tons.¹ In Switzerland, the quantitative consumption of meat has already surpassed the one of bread (this has probably happened in other countries as well).² This fact has enormous ecological as well as economical consequences worldwide. Unfortunately, these consequences do not receive much attention.

Liquid manure causes dying of forests

The latest scientific research indicates clearly that today's mass keeping of livestock is one of the main causes of the dying of forests. Biologist Dr. Hans Mohr³ states in „Spektrum der Wissenschaft“ of January 1994: „An essential insight gained by ten years of research on forest damage is that atmospheric amounts of nitrogen and especially ammonium⁴ nitrogen, which first of all stems from agriculture, must be reduced. [...] The disposal of the steadily increasing quantity of liq-

Emmissions of ammonia from agriculture stem to about 90% from liquid manure and dung⁵.

uid manure and human excrements remains the cardinal problem.“



Nowadays, human excrements are for the most part being disposed of by sewage plants; animal excrements, however, are still being poured respectively sprayed onto the fields. The result of this is that nitrogen (N) in the form of ammonia (NH₃), which is today considered to be mainly responsible for the dying of forests, is being caused to 85% by the emissions of livestock.⁶ Nitrogen, actually an essential nutrient for meadows, forests and life in the water, can lead to over-fertilization if available in excess. This was noticed too late because forests would first grow faster with high nitrogen supply and react with first damages only when the soil was over-saturated with nitrogen.

In 1992, the research committee of the German Bundestag on the topic „Preservation of earth atmosphere“ reached the same conclusion. Regarding ammonia (NH₃), they published in „Climatic changes threaten national development“:

„The NH₃-emissions are nationally (FRG), continentally (Western Europe) and globally to be assigned to 90% to agriculture and to 80% to the keeping of livestock. 528'000 tons of NH₃ are emitted annually in the Federal Republic of Germany. Ammonia is found and starts in the stable area, on the pasture as well as when storing and bringing out organic fertilizer. [...] Ammonia and nitrogen release could be decreased by reducing the number of livestock, changes in feeding and reduction of bringing out liquid manure. [...] This would be desirable not only in ecological, but also in economical respects.“⁸

To get a picture of **economical consequences of the dying of forests**, these consequences were calculated taking as an example the Swiss resort of Davos⁹: Partial deforestation of local forests would therefore cause appr. SFr. 267 mio. of resulting costs, a complete deforestation would cost appr. SFr. 508 mio. Even if all steeper areas of forest would have to be replaced by avalanche barriers, it would cause costs of SFr. 415 mio.

Destruction of water

Ammonia does not only have terrible consequences for forests, but also for water. Over-fertilization causes among other things an unnatural growth of algae, which

in turn extract oxygen from the water. Animal-factories, which nowadays work independent of soil, produce such an amount of liquid manure that ground water is being seriously threatened.¹⁰ For example, the Swiss lake of Sempach as well as the lake of Baldegg are given artificial respiration with a huge oxygen blower. About 50% of water pollution in Europe is caused by mass keeping of livestock. Nitrate from agriculture has already today penetrated so deep into the ground water that some of the mineral water labels no longer comply with guiding values for drinking water.¹¹ In the USA, the share of agriculture on water pollution is already bigger than all cities and industries together!¹²

Over-acidification of the soil

Ammonia and nitrogen oxide (NO_x) contribute substantially to over-acidification of the soil. This happened to such an extent in Holland already in 1989 that the department had to take on the problem. Results of the Dutch Institute for Health and Protection of the Environment¹³:

„Nitrate from liquid manure being released as ammonia into the air is an environmental poison which causes so-called acid rain and other deposits containing acid. In Holland, most part of the precipitation comes from ammonia gases out of cow barns - they cause more damage to the country than all of the automobiles and factories.“

Hothouse effect

Up until now, mainly traffic and industry have been held responsible for the hothouse effect. The influence of agricultural keeping of livestock has also been neglected for a long time in this respect. The head of the Wuppertal-Institute for Climate, Environment and Energy, Ernst U. v. Weizäcker comments on this: *„The contributions of cattle breeding to the hothouse effect are about the same as for the total of automobile traffic, if we take into consideration clearing of forests for cattle and for fodder. [...] And the transformation from savannas into deserts, the erosion of mountain areas, the excessive need of water for cattle, the gigantic need of energy for keeping fattening animals are only further reasons for our taking a lot out of our environment with each pound of beef.“*¹⁴

Among other things, the hothouse effect is caused by the three gases of methane, carbon dioxide and nitrogen oxide. All three of them originate in the agricultural keeping of livestock in big numbers. 12% of methane gas emissions are caused only by the 1.3 billion cattle

Since 1970 more than 20 million hectares (1 hectare = 2.47 acres) of tropical forests have been changed into pastures for cattles.

Worldwatch Institute

kept worldwide. Breeding of livestock causes 115 mio. tons (115'000'000'000 kg) of methane gas yearly. This gets even more critical if one considers that one molecule of methane contributes 25 times more to the hothouse effect than one molecule of carbon dioxide.¹⁵

Cattle pastures already cover one third of the land mass of this planet.¹⁶
Worldwatch Institute

Waste of resources

Consumers who are responsible for the production of meat are also mainly responsible for wasteful use of resources. On the same piece of land that is needed to produce one kilogram of meat, one could harvest 200 kg of tomatoes or 160 kg of potatoes in the same period of time. In Switzerland, approximately 67% of productive land are being used for keeping livestock and growing fodder.

Approximately 100 liters of water are needed to grow 1 kg of grain, the production of 1 kg of meat, however, takes 2'000 to 15'000 liters of water.

Waste of foodstuff

One needs 7 to 16 kg of grain or soya beans to produce 1 kg of meat. This can easily be defined as one of the most effective ways to waste foodstuff. This artificial extension of the foodchain

One piece of land can produce the following quantities of foodstuff¹⁷:

Cherries	1'000 kg
Carrots	6'000 kg
Apples	4'000 kg
Beef	50 kg

due to the transformation from grain into meat causes, among other things, 90% of protein, 99% of carbohydrates and 100% of fibre to be lost. In addition to this, only a small portion of the body of a slaughtered animal consists of the actually desired meat. Only 35% of the weight of a cattle or 39% of a calf (without bones).¹⁸ Nevertheless, in Switzerland 57% of the grain are still being fed to animals (1990). In the USA, 80% of the grain harvest are being fed to about 8 billion slaughter animals. Regarding soya beans, this amounts to even 90% worldwide.¹⁹ About half of the worldwide produced grain is being fed to animals in order to eat their meat. If e.g. Americans would eat 10% less meat, the quantity of the grain thus saved could save about one billion people from starvation. About 1'200'000 tons of concentrated feed are being fed to livestock in Switzerland only, mostly grain. Switzerland can afford this waste, however, it hardly looks any better with developing countries: As FAO reports, in 1981 75% of the grain imports into the Third World were used for fodder. But also domestic cultivation of foodstuff is competing with worldwide cultivation of fodder: In Egypt e.g., over the last 25 years, cultivation of corn as fodder has taken over fields that used to

produce wheat, rice and millet as staple food. The margin of grain used for fodder has increased from 10% to 36%.²⁰ A similar thing happened to other countries that increased their meat consumption. During 1950, 170 kg of grain per head were adequate to nourish the population of Taiwan. Until 1990, meat as well as egg consumption had multiplied sixfold. Grain requirement per head has increased to 390 kg because of this extension of the food chain. Taiwan can only meet this rising demand by imports, despite steadily increasing harvests. While Taiwan was exporting grain in 1950, in 1990 it had to import its needed quantity from abroad, mostly as fodder.²¹ Similar numbers apply to the former Soviet Union: Meat consumption has tripled since 1950, the demand for fodder has quadrupled. In 1990 the cattle of the former Soviet Union consumed three times as much grain as the people. Imports of grain used as fodder reflect this: They increased from almost zero in 1970 to 25 million tons per year in 1990. The Soviet Union became the world's second largest importer of fodder.

Effects on health

Through the extension of the food chain by feeding plant-

A vegetarian diet is not only possible, but also very healthy.

like foodstuff first to animals and then eating their meat, there is another disadvantage: pesticides, heavy metals and other poisons contained in the fodder add up in the animal's body. This causes e.g. contents of pesticides in meat to be 14 times higher than in plantlike foodstuff, the contents of the pesticides in dairy products to be 5.5 times higher. Consumption of animal products on a massive scale has increased so much over the last decades that the disadvantages of such a diet are now becoming obvious: high blood pressure, heart diseases as well as diseases of the circulation system, rheumatism, gout, neurodermatitis and certain kinds of cancer are only a few of the so-called illnesses caused by civilization of which we know that consumption of animal products is the main trigger. The claim used to be heard quite often that man would need meat to stay healthy. This has been disproved by scientists for a long time and is only being stated by a few of the representatives of the meat lobby.

Economy

How is it possible that meat consumption is still increasing worldwide despite the above mentioned tremendous disadvantages of a meat orientated society?²² Besides a few psychological and social reasons mostly caused by advertising (e.g. meat gives you strength, etc.), there is one aspect that should not be underestimated: money. At first glance this seems to be a contradiction as under normal conditions a branch of the economy programmed to destroy foodstuff and resources would have collapsed long since. There is no

longer any reasonable relation between the costs and the advantage of this worldwide meat production.

Costs are being shifted onto the taxpayer

One reason why the meat industry still exists is that the revenues of this business are being transferred into private ownership, the costs, however, are still being shifted onto the public (and therefore onto the taxpayer). This is well known of other branches of the economy (e.g. automobile industry). No trace of cost truthfulness in agriculture either: According to estimates made by the renowned Worldwatch Institute in Washington, the price for meat would have to be doubled or tripled if one took into consideration the full ecological costs including burning of fossil fuel, lowering of the ground water level, chemical pollution of the soil and release of gases like ammonia and methane.²³ Let alone the resulting costs of the public health system.

State-subsidized madness

In contrast to other branches of the economy, the meat industry is state-subsidized in almost all of the countries because it would not be profitable (despite shifting the costs). In Switzerland, the state uses approx. 84% of agricultural subsidies to support the production of meat, dairy products and eggs. Only 16% are available for production of plantlike foods.²⁴

Federal spending to secure prices and sales (1992 in SFr.)²⁵:

For **livestock business**: 1'205.9 million
For **growth of plants**: 332.1 million

In no other branch of the market is the picture being so distorted as in the agricultural sector. Could you imagine a private company receiving more subsidies from the state than it takes in through the sale of produced goods? This even if the purchase of goods is granted through the state? The whole economy of the Eastern Bloc countries was led into an abyss by such politics. In countries with a free-market economy, such politics are limited to agriculture.

77% of the revenues of the Swiss economy are traced back to direct and indirect subsidies as well as countless interventions by the state. This costs the state SFr. 7 billion each year.²⁶ Up until now, there are 3'500 people working for the agricultural bureaucracy of Switzerland. They spend SFr. 900 mio. per year on the support of agricultural organisations only.²⁷ Approximately 99.5% of this figure are available for keepers of livestock. The same goes for the other industrial countries. Livestock business is not only supported and kept alive nationally, but also internationally: from 1963 until 1985, the World Bank pumped US\$ 1.5 billion into livestock business of Latin America only,

mostly into big cattle ranches.²⁸ Despite shifting of the costs and despite horrendous subsidies, agriculture remains a double-faced and crazy business for farmers and banks alike: In the USA, at certain times about 2000 farmers per week quit their jobs because they cannot keep up with the intensifying of today's meat production.

Farmers need more and more expensive machines and in order for them to be able to buy these machines, they need higher loans from the banks. During 1986 e.g., 160 US banks went bankrupt, most of them were driven into their ruin by agricultural business.²⁹

Concluding remarks

Because one's diet is something very personal, reflection over the consequences it might have is very unpopular. Nevertheless, this article tries to outline the ecological and economical consequences a diet based on animal products can have to those people who are conscious and know of their responsibility towards their environment. All topics mentioned in this article do have serious economical consequences. A lasting and environmentally compatible economic system is not possible without taking into consideration these facts. One can only hope and desire that in the future not only environmentalists and people who want to prevent cruelty against animals will try to deal with the problems of the consumption of meat, but also economists and politicians. For pioneers for a free-economy³⁰, like e.g. Werner Zimmermann, this was natural; they committed themselves to a vegetarian way of life as well as to changes in our economic system. Contrary to changing our economic system, which might prove to be very difficult, everyone can start making changes in his diet.

Recommendation of books:

- Rifkin, Jeremy: *Beyond Beef. The Rise and Fall of the Cattle Culture*, Campus, 1992
- Robbins, John: *Diet for A New America*, Stillpoint Publishing, ISBN 0-913299-54-5.
- A. Durning, H. Brough: *Animal Farming and the Environment*, Worldwatch-Paper 103.



SWISS UNION FOR VEGETARIANISM (SUV)
 Further reasons for a vegetarian way of life can be asked for at the office of SUV:
 Vegi-Büro Schweiz, CH-9315 Neukirch-Egnach
 Tel.: 071 477 33 77, Fax: 071 477 33 78.

Footnotes:

- 1 Swiss Co-operative for Slaughter Animals and Meat Supply.
- 2 53 kg of bread per year per head versus 55.5 kg of meat. According to the Swiss Co-operative for Slaughter Animals and Meat Supply.
- 3 Belongs to the German Academy of Natural scientists at and to the Academy of Sciences of Heidelberg whose research centre is under his guidance since 1986. Honorary doctor of the Universities of Strassburg and Limburg.
- 4 Ammonium (NH₄⁺) is formed in the air from ammonia (NH₃).
- 5 Hans Mohr in "Spektrum der Wissenschaft" January 1994, page 50
- 6 Study-work during studies of environmental protection technics at TU Munich: Contribution from Dipl. Eng. Matthias Holzer regarding nitrate and ammonia emissions relating to the dying of forests, 1993
- 7 Dr. Klaus Isermann, at the symposium "Ammonia in the environment - cycles, effects" in Braunschweig from October 10 through 12, 1990
- 8 Joint declaration of 27 members of the Enquete-committee where all governing parties and 14 scientists are represented
- 9 From: Contribution regarding forestry by the field of forest economy and forest politics, ETH Zurich 1989/8: The consequences of forest damages by David Altweg, pages 279-280.
- 10 To produce pork for the Swiss population, 890'000 tons of fodder are needed and 2.5 million m³ liquid manure are produced (calculated by "Konsum und Umwelt", WWF Switzerland, magazine No. 1/94)
- 11 According to the TV-show "Meat eats people" of the WDR (West German Television) of 12/17/1987
- 12 Cross, Russell H., Byers, Floyd M., and others: "Current Issues in Food Production A Perspective on Beef as a Component in Diets of Americans", page 5.26, April 1990
- 13 Quoted from Worldwatch paper "Zeitbombe Viehwirtschaft" (Time bomb livestock business), page 22
- 14 From his preface in: Jeremy Rifkin "Das Imperium der Rinder", (The imperium of the cattle), Campus Verlag, page 12, 1992
- 15 Rifkin, 1992, page 191 and "Zeitbombe Viehwirtschaft" (Time bomb livestock business), page 30
- 16 "Zeitbombe Viehwirtschaft" (Time bomb livestock business), pages 22-23
- 17 Including areas of land for production of fodder. Source: EarthSave Foundation. Depending on production or breeding method, values can vary strongly.
- 18 According to numbers from Swiss Co-operative for Slaughter Animals and Meat Supply
- 19 according to: EarthSave Foundation
- 20 from Worldwatch Paper "Zeitbombe Viehwirtschaft" (Time bomb livestock business) from Alan B. Durning, page 36.
- 21 "Zeitbombe Viehwirtschaft" (Time bomb livestock business), page 33
- 22 Even though changes are noticeable (because of health reasons), worldwide meat production is not decreasing. The steadily increasing surplus of the meat producers is exported at ridiculously low prices into developing countries instead and there they drive the meat consumption higher. At the same time, local markets are being destroyed by this cheap meat.
- 23 "Zeitbombe Viehwirtschaft" (Time bomb livestock business), page 48
- 24 Averages from 1986-1988, total yearly subsidies for agriculture: SFr. 7.2 billion. Source: CASH, 8/3/90
- 25 From: Statistical yearbook of Switzerland of 1994, pages 193-194
- 26 Brückenbauer, page 4, 2/15/95
- 27 From: CASH No. 5, pages 32/33, 2/3/95: "Many profiteers hang on to the udders".
- 28 "Zeitbombe Viehwirtschaft" (Time bomb livestock business), page 45
- 29 According to Prof. Frederic Vester, biochemist, publicist in the TV-show "Meat eats people" of WDR on 12/17/87.
- 30 Theory of an alternative, fair, ecological and social economic system without interest, compound interest and inflation. More information on this subject: INWO Switzerland, P.O. Box, CH-5001 Aarau.