Graduate School of the Environment

FORAGING EXERCISE IN ECOSYSTEM MODULE, APRIL 2018

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We spent a happy couple of hours collecting wild foods, mostly leaves of various kinds. It was April after all, and plant growth had only just got started. Nevertheless, there was a fair variety of items, and we collected about 350 grams of fresh material.

We then took our materials and matched them with four different preparation techniques:

* Eating raw, simply chopped with a little oil and salt
* Tisane, steeping in boiling water and drinking the ’tea’
* Steaming, like spinach, and eating hot, perhaps with a little oil and salt
* Tempura, coating in whole-wheat batter and deep frying

We also collected some standard salad items from the garden to compare with the wild foods. ‘Bland’ garden salads are often mixed with more strongly flavoured wild plants, but in this case we used them side by side to compare.

The combinations of collected plants and preparation techniques are shown in the table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| PLANT | RAW | TISANE | STEAMED | TEMPURA |
| |  | | --- | | BITTERCRESS | |  |  |  |  |
| BRASSICA FLOWERS |  |  |  |  |
| |  | | --- | | BURDOCK STEMS | |  |  |  |  |
| |  | | --- | | GARLIC MUSTARD | |  |  |  |  |
| GROUND ELDER |  |  |  |  |
| LEMON BALM |  |  |  |  |
| MARIGOLD FLOWERS |  |  |  |  |
| NETTLES |  |  |  |  |
| COMMON SORREL |  |  |  |  |
| PRIMROSE |  |  |  |  |
| |  | | --- | | SHEEPS SORREL | |  |  |  |  |
| SWEET CICELY |  |  |  |  |
| WILD GARLIC |  |  |  |  |

It is probably fair to say the exercise was fun and the flavours much appreciated. We could all see how even a small amount of foraging could make a difference to the flavour of a salad, or provide an interesting addition to a meal. Almost certainly these wild foods are providing us with micronutrients: extra minerals we might otherwise lack, some vitamins, fibre, and perhaps some indefinable quality of ‘vitality’.

In relation to the rest of the course, it is important to ask whether such foods can provide macro-nutrients as well as micro-nutrients, particularly calories and proteins. The simple answer is that they do not. We weighed everything and the ‘translated’ into calorie and protein content using the closest foods analysed by McCance and Widdowson in their encyclopaedic *Composition of Foods Integrated Dataset.* We also applied the same analysis to the garden foods and to the flour and oil obtained from the CAT restaurant. The results are shown in the Figure below.

Broadly speaking, the raw weight of the three sorts of foods was the same, but we can see that this is a poor guide to macro-nutritional content. The energy-content of the raw green foods was very low. In fact, they are all over 90% water, although it does not look like it. In contrast, the flour and oil, which we got as extras or ‘enablers’ to help us prepare the foods and make them more palatable, turned out to contain most of the energy. Although we used a lot of oil for frying, we only actually consumed about 20 grams of oil. But it is very high in calories, and contributed about 20% to the total energy.

Oil has no protein, but wholemeal flour does, and the 250 g of flour we used contained almost three times as much as the foraged food.

When it comes to foraging *time*, it is obvious that collecting the wild foods took much longer than simply plucking things from the garden. This does not include the time gardeners have spent preparing and caring for the crops, but from our general experiences in gardening it should be obvious that with a suitable plot of soil you would get more for less time. We have after all spent thousands of years breeding high-yielding crops and developing labour-saving techniques, and this has even speeded up a bit recently.

You’ll notice I have not included collection time for the restaurant items, because it’s too complicated, but presumably the farmer who produced the original crops, and the factories who processed them, and the wholesaler who sold them to the restaurant, all need to make a living. It is unlikely they will have spent two and a half hours collectively producing materials that retail at around 50p. Even if everybody was paid at minimum wage rates they would have spent no more than a few minutes producing the flour and oil, as a proportion of total supply.

All these considerations reinforce a regular theme in the Sustainable Food course, that humans are not gorillas and cannot easily live on green browse. They have evolved, both naturally and culturally, to rely on concentrated sources of energy and protein. And farming systems have evolved to provide these sources abundantly and economically, by only a few percent of the general population.

This is not to say that foraging is a waste of time. The ideal sustainable diet relies on a bedrock of starch and protein provided by farmers, who are very good at it. They do also provide fruit and vegetables, but we can also supply these ourselves. Personally, I like to grow half, buy half. The foraging bit is more of a compulsion: it’s inefficient but fun.

Consider the meal shown in the picture. It’s got everything. Farmers will provide the rice and the goat-cheese, although you do not really need the cheese. The rest you can produce yourself, with seasonal variations. All it lacks is a little foraged zing!

And remember, we were collecting at a thin time. In certain times of year there are fruit bonanzas: sloes, bullace, acorns, blackberries, rose-hips, lime-blossom, hazel nuts, mushrooms, pignuts, wild strawberries and raspberries. And if we really wanted to depend more on the unamended natural world we would get animals to do most of the foraging, then hunt and eat *them*: rabbits, hares, squirrels, deer, boar, pigeons, ducks, Canada geese, pheasants, grouse etc.

….but not many people could do that without running down the stocks. The illustrated meal on the plate is genuinely sustainable. We can easily supply this to 9 billion people and leave enough for the hares, especially if we did spuds or barley or buckwheat instead of rice.

Although the natural plant world is largely inedible to us, with a bit of technology we could probably extract a lot of edible protein. I have done it with grass, extracting cell sap and precipitating the protein. It’s highly nutritious, but deep green and rather bitter. A cow does much the same, but creates something white and delicious. How does she do it?

Having said this, the protein content we have estimated from foraged green edibles is not negligible. We got about 10 g of protein from 350 g of raw material. An adult can probably be healthy on 50 g a day, and to get this you would have to consume 1.75 kg of suitable green forage. This is an awful lot but not unimaginable. At the gathering rate we managed, this would take 12.5 hours to collect, again tough but not unimaginable. So if you had nothing else, you could survive. And of course you’d get much better at it, and supplement your green materials with the storable, more concentrated seasonally-available sources already mentioned, many of which would also provide energy.

It puts a new spin on the notion of gorilla gardening.