

PROCEEDINGS
OF THE FIRST INTERNATIONAL
GREEN CROP DRYING CONGRESS

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OF THE FIRST INTERNATIONAL
GREEN CROP DRYING CONGRESS

HELD AT THE
UNIVERSITY OF OXFORD
ENGLAND

9-13 APRIL 1973

First International Green Crop Drying Congress
OXFORD ENGLAND

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THE PRESIDENT'S ADDRESS

The President, Lord Netherthorpe, opened the 1st International Green Crop Drying Congress on Monday, 9 April 1973, and addressed the assembled members as follows:

Ladies and Gentlemen,

It is my proud privilege to welcome the 300 delegates from no less than 23 countries to this, the 1st International Congress on Green Crop Drying. I particularly welcome the overseas visitors to Britain, and to Oxford, this historic centre of learning. May the environment inspire your creative thought.

It could be said that the basic theme of this Congress is the conservation of the harvest of plenty, which nature in her bounty provides, so that her benefits can be spread over the whole year.

The first plans for this Congress were made some two years ago. There were already indications of a growing interest in green crop drying in many parts of the world, and general agreement that it would be useful to hold an international meeting for the interchange of information and ideas on the potentialities, as well as the problems, of this developing industry.

But we could hardly have anticipated the events of the last two years which have now made the subject of green crop drying even more topical. Foremost among these has been the growing world shortage of some animal products, in particular, meat, which has been followed by the unexpected shortfall in supplies of cereal and protein feedstuffs. These shortages have combined to produce a marked increase in the price of animal products to the consumer. Indeed, for the first time perhaps, we have seen a novel reaction from the consumer, reflected in a buyers' resistance to the purchase of animal products.

For example, as a result of the replacement of vegetable for

animal products, people in The Netherlands are now eating very little butter, whilst even in the UK, the consumption of this commodity has fallen considerably in the last year.

In the USA, 'analogue' meats, based largely on soyabeans, are becoming widely accepted. It is worth noting that 'analogue' proteins may now comprise up to 30% of the 'meat' content in the 25 million school meals served each day in the USA.

Livestock producers, therefore, must contain their production costs if their products are to remain competitive, and in this context, the feeding of dried green crops could play an important role. Nowhere is this more marked than within the 9 countries of the European Economic Community (EEC), delegates from all of which are attending this Congress.

Even before the recent rise in world prices, high cereal prices had already begun to make dried green crops an attractive alternative to the more conventional bought-in feeds. In the papers to be presented later this morning we shall be hearing something of this development, both in the EEC and in other parts of the world.

Much of the impetus in this field derives from the results of research on animal feeding in the laboratories of many countries where it has been demonstrated that green crop drying is a progressive method of feed processing, rather than merely a more efficient method of crop conservation. The significance of this approach is in evidence in that more than half the papers at this Congress deal with the subject of animal feeding *per se*.

Yet alongside these trends, the last two years have also seen a growing awareness of the problems of world energy supply - and we now have to ask how far we can prudently base future animal production systems on the use of 'fossil fuels' to evaporate water from green crops of high moisture content. I believe this is a vital question for discussion at an international congress, since fuel supply is an international rather than a national problem.

During the course of this Congress, therefore, we should attach particular importance to those papers that examine some of the factors which determine thermal efficiency in green crop drying. It may be difficult to avoid the conclusion that the dehydration industry may have to pay more attention to thermal efficiency, even at the expense of convenience in management, if the increasing use of scarce fuel

resources is to continue unabated.

We are faced, then, with two trends - the developing potential of dried green crops in animal feeding; and green crop drying as a user of fuel, in both of which we aspire to maximum efficiency. Let it be our avowed intention to ensure that the papers, discussions and visits during the next few days shall contribute towards this important goal

In this spirit I have much pleasure in declaring this International Congress open. May your deliberations be fruitful for the benefit of both man and beast.

BUSINESS MEETING

The Business Meeting was held during the morning of 13 April 1973 - the closing day of the Congress.

The Chairman, Mr. J. H. W. Wilder, said that there were 3 main points that he believed should be discussed at the final session:

- (i) Was there a general wish for a second International Green Crop Drying Congress? *A proposal that there should be a second congress was warmly approved;*
- (ii) How soon should the next Congress be held? *There was general agreement that this should be in either 1976 or 1977. Five years was considered to be too long a delay.*
- (iii) In which country or area of the world should the next congress be held? *Delegates agreed that it would be preferable for the second congress to be in an area distant from the present congress, and that venues in North America (possibly Canada) and Eastern Europe would be equally suitable.*

Dr. I. R. Lane (UK) considered that in deciding the timing and venue of the next congress, due note should be taken of other related international meetings dealing with forages, livestock feeding and engineering.

Dr. G. O. Kohler (USA) and Mr. H. Moeller (USA) announced that The American Dehydrators Association with, they felt certain, the support of the United States Department of Agriculture would now consider extending an invitation for the next congress to be held in California, which had both an extensive dehydration industry and major research facilities. The year 1976 might be a suitable date.

The Chairman said that if delegates were agreeable, the Management Committee for the present congress would continue to operate until the venue of the next congress was agreed and a new management committee could take over. Invitations from countries wishing to act as hosts to the next congress should, therefore, be sent to the present management committee who would fully consult other

interested organizations before deciding which invitation should be accepted. They would then hand over full responsibility to the next national committee.

Mr. D. Burt (UK) stated that The British Association of Green Crop Driers were the initial sponsors of this congress. As President of the Association, he would like to say how very pleased they had been with its success.

The Chairman thought that if delegates had any comments to make on the organization of the congress or the subjects discussed he was sure they would be of interest to the next committee.

Mr. B. R. Bentholt (Denmark) hoped that the next congress would give particular emphasis to definitions and standards for dried green crops.

Mr. E. H. Phillips (UK) pointed out that The British Association of Green Crop Driers had already set up a committee to discuss these topics, and it was hoped soon to widen those discussions on an international basis.

Prof. E. Persoons (Belgium) felt that the form of the present congress, with its wide range of subjects being discussed by delegates with diverse interests and coupled with technical visits, was excellent. However, he suggested that, in future, rather more emphasis should be given to the techniques of dehydration and processing, which were of much importance in both the construction and use of drying installations. He also supported the need for standard methods of evaluation. For this it might be advisable to set up a committee, including both scientists and operators of driers, possibly within the International Commission on Rural Development (CIGR) which would lead to an international meeting on the subject. He added that this subject would be discussed at a CIGR Congress in Belgium in September 1974.

The Chairman thought that this seemed a very useful subject to discuss with the International Standards Organisation.

Mr. V. Christensen (Denmark) suggested that other problems to be discussed could include world protein supply, pollution, and price and quality control. But it must be remembered that events were changing rapidly; new aspects might have become important before the next congress and attempts should not be made to do too much of the planning of the programme for the next committee. He brought regards from the Chairman of CIDE, Count von Courten, who was unable to attend this final session, and his warmest thanks to the organizers for the success of the congress.

The Chairman said that this brought him very appropriately to his final task, as Chairman of the Congress, to give thanks on behalf of the delegates, to all those who had contributed to its success. He would like to express sincere thanks to:

The President, Lord Netherthorpe, and the other patrons who had given so much support and encouragement.

The British Association of Green Crop Driers, who were the initial sponsors of the Congress, and who had supported it at every stage.

The Directors of The Grassland Research Institute, the National Institute for Research in Dairying, the National Institute of Agricultural Engineering, and the Plant Breeding Institute and the Director-General of the Agricultural Development and Advisory Service, for the great assistance given by their staff members to the planning and conduct of the Congress.

The members of the committees who had organized the Congress, including the editors and members of the Programme Committee who had provided such an excellently produced set of papers - and, let it not be forgotten - the authors from many countries who had written and presented their papers so well.

Mr. Roper and his staff in the Gulbenkian Theatre for the very great help they had given us, and the patience they had shown during the last week.

The translators, the slide operator and the students who had helped the sessions to run so smoothly; and the chairmen and speakers who had ensured that the sessions ran exactly to time.

The University and College staffs, who had helped to make the delegates' stay in Oxford so enjoyable.

Shell International Petroleum Company Ltd, the National Institute for Research in Dairying and The Grassland Research Institute for the notable visits they had organized during the Congress.

The companies who gave such generous financial support to the Congress, and who helped to entertain the delegates in Denmark.

The wives who helped to organize and who took part in the Ladies' programme.

The Meat and Livestock Commission, which helped to organize, and which under Mr. Henry Lewis would guide, the Post-Congress Tour that would set out from Oxford that afternoon.

The administrative and public relations organization, including the many volunteers who looked after the reception of delegates; Mr. Ken Brett and his committee; and in particular our secretariat, Mr. Edgar Phillips and Mrs Mary Pritchard.

The delegates, for their resolute support in ensuring the success of this, the First International Green Crop Drying Congress.

Mr. C. Monnier (France), President of The French Dehydrators Association, speaking on behalf of the French delegation, thanked and congratulated the organizers of the Congress which had brought together much data on crop drying. He said that the deliberations of the Congress should help us to work together towards a common goal.

Mr. D. Burt (UK) said that he knew that, in their turn, delegates would wish to join The British Association of Green Crop Driers in giving their most sincere thanks to Mr. Tim Wilder who, as Chairman of the Management Committee, had guided the Congress through all its stages.

This proposal was carried by the delegates with acclamation.

VISIT TO SHELL FARM A/S, TJELE, DENMARK

On Wednesday 11 April 1973, 290 delegates and members of the Congress organization visited the Shell Farm at Tjele in Denmark. This farm, of approximately 550 ha, was set up in 1969 by the Shell International Petroleum Company to investigate and demonstrate the practical aspects of crop production, harvesting, drying and processing, and feeding, in the overall activity of green crop drying.

After leaving Oxford at 06.00 h, the party flew from Luton Airport to Aalborg in N. Jutland, and thence went by coach to Viborg, where they were entertained to lunch by the Mayor and Council of this old cathedral city. During lunch the delegates were welcomed by the Mayor, by the Minister of Fisheries, and by the British Ambassador in Denmark. Mr. J. H. W. Wilder, Chairman of the Congress Management Committee expressed the warm thanks of the guests to their hosts.

Mr. J. Ohnemus, General Manager of Shell Farm, outlined the arrangements for the visit and the delegates then travelled by coach the 15 km to the farm. There they saw the work of the 3 main sections: the Field Section (J. Nannerup) responsible for supplying crop to the drier from the 550-ha Tjele farm and from 1300 ha grown under contract; the Drying Section (P. Hattesen), which is equipped with a drier of 30 t evaporative capacity/h, a complete feed-mixing and -processing plant, and storage for 18,000 t dried product; and the Cattle Section (R. Vind) which has facilities for individually feeding 124 dairy cows, and for group feeding heifers, beef cattle and calves on rations composed of different proportions and types of processed forages.

The delegates spent 3 h inspecting these sections, each of which was introduced by the officer-in-charge, and discussing the results of investigations carried out during the first 3 seasons of operation.

Mr. J. H. W. Wilder warmly thanked Shell International Petroleum Company and their staff for the arrangements they had made for this most successful visit.

TECHNICAL VISITS

Delegates visited The Grassland Research Institute, Hurley, Maidenhead and the National Institute for Research in Dairying, Shinfield, Reading on the afternoons of 10 and 13 April. The Grassland Research Institute is a grant-aided institute of the Agricultural Research Council and has been involved in research on green crop drying since 1966. Delegates were welcomed by the Director, Professor E. K. Woodford OBE, and shown demonstrations on: (i) forage dehydration and processing, (ii) the production of crops for the drier and the prediction of digestibility, (iii) beef production using dried forages and (iv) the use for milk production of rations consisting of dried grass and silage. The National Institute for Research in Dairying is financed mainly by the State through the Agricultural Research Council and has been working on green crop drying since 1966. Delegates were welcomed by the Director, Professor B. G. F. Weitz OBE, and, after watching a film of the Institute's activities, were shown demonstrations on: (i) dried grass wafer production (Taarup Unidry) and forage juice extraction, (ii) milking parlours and the mechanized feeding of dairy cows, (iii) facilities and experiments designed to improve precision in feeding dairy cows, (iv) effects of feeding dried grass on the fat-soluble-vitamin content of milk and (v) lucerne juice as a component of pig rations.

ASSOCIATE MEMBERS' PROGRAMME

Thirty four delegates' wives from 11 countries took part in the associate members' programme.

On the Monday, after a short walking tour of Oxford, they visited and had lunch at Blenheim Palace. On the following morning a visit was made to Shakespeare's birthplace and the theatre at Stratford-upon-Avon, and in the afternoon to Compton Wynnyates, a Tudor mansion set in beautiful country surroundings.

On Wednesday, whilst the delegates went to Denmark, the wives were taken to London and spent some time in one of its famous stores, thence a coach tour of some of London's historical places, followed by a visit to the theatre to see Coward's *Custard*. On Thursday, they visited Windsor and returned to Oxford in time for the Congress Banquet where expressions of appreciation were made and gifts presented to Betty Raymond and Jean Burtt, who had acted as hostesses to the party.

HER MAJESTY'S GOVERNMENT RECEPTION

On the evening of Monday, 9 April, Her Majesty's Government in the United Kingdom of Great Britain and Northern Ireland entertained the Congress delegates and associate members to a Reception in the Great Hall at St. Catherine's College, Oxford. The Minister of State at the Ministry of Agriculture, Fisheries and Food, Mr. Anthony Stodart, MP, was unfortunately unable to be present to receive and welcome the guests, and his place in this pleasant task was taken by Sir Emrys Jones, Director-General of the Agricultural Development and Advisory Service, and one of the Patrons of the Congress.

THE CONGRESS BANQUET

More than 270 members, delegates and guests attended the Congress banquet which was held at the Randolph Hotel, Oxford, with Lord Netherthorpe presiding. The principal guests were Herr Hans-Helmut Wächter, Head of Directorate B of the EEC Commission (Organization of Markets in Crop Products) and Sir Emrys Jones, Director-General of the Ministry of Agriculture's Agricultural Development and

Advisory Service. Herr Wächter, replying to the toast to The Congress, proposed by Sir Emrys, said that the attendance at the Congress had brought home to the Commission the growing importance of dried crops. Appropriately, the banquet menu included beef reared on dried grass.

POST-CONGRESS TOUR*

Thirty-three delegates and associate members took part in the post-Congress tour, which left Oxford in the early afternoon of Friday, 13 April. After an overnight stop in Stratford-upon-Avon the party visited the National Agricultural Centre at Kenilworth, Warwickshire. Here they saw the work of the Meat and Livestock Commission Bull Performance Testing Centre, in which cobs containing 50% dried grass are used as the standard feed, and of the calf and beef units, where techniques of housing, feeding, management, etc. are demonstrated and evaluated under practical conditions. The Dairy House Farm of ICI Ltd, at Middlewich in Cheshire, was visited in the afternoon, en route to the overnight stop at Morecambe in Lancashire; on this farm studies are made of systems of dairy and beef production based on intensively managed grass, with particular emphasis on the use of high rates of fertilizer nitrogen.

The whole of Sunday, 15 April, was spent on a scenic tour of the Lake District and the North Pennines, and after lunch at Keswick, a stay was made in York that evening.

On the following day, a morning visit was made to the farm of Mr. H. R. Fell, at Worlaby House, Brigg, Lincolnshire. This farm of about 900 ha, much of it on heavy land, demonstrated the intensive management of a number of complementary enterprises, including cereals, vegetables and a large sheep flock, and the important role of well-managed grassland in such a system. In the afternoon the party visited the Misson green crop drying station at Bawtry, Nottinghamshire, one of a number of units operated by Mr. F. Arden, CBE. This unit is equipped with the first high-temperature drier built by Ames Crosta Mills in England; it has an evaporative capacity of 17 tons water/h, and represents the first stage in Mr. Arden's plan to increase his organization's production to 100,000 tons by 1980. The crops grown for drying are fully

*Organized on behalf of the Congress by the Meat and Livestock Commission.

integrated with cereal and potato production, and with a number of livestock enterprises.

After an overnight stop in Lincoln the party spent a morning visiting two commercial drying units, those of Mr. D. Burtt, at Brandon, Lincolnshire and of Belvoir Grass Drying Co., near Grantham, Lincolnshire. Both these units dry green crops which are grown in intensive rotation with cereals and other crops; production targets for 1973 are 4000 tons at Brandon and 8000 tons at Belvoir.

Lunch was taken with the Duke and Duchess of Rutland in the Great Hall of Belvoir Castle and the party then travelled to Cambridge, where time was available for a tour of this old University city.

The morning of 18 April was spent visiting Dengie Crop Driers Ltd, Southminster, Essex, one of the 4 cooperative drying enterprises which have been set up in the UK since 1969. The initial group, based on a drier of 5.5-ton evaporative capacity/h, has recently been expanded with the installation of a 10-ton drier. During 1973 an output of 8000 tons is planned, harvested from 1800 acres on the farms of the 20 farmer-members. Much of the dried crop produced, particularly lucerne cobs, is fed to the 1500 cows kept by members of the cooperative, including two herds of 350 and 200 cows, which were inspected during the visit.

From Essex the party travelled to London Airport, to complete a rewarding and informative tour.

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