



European Association of
Film Manufacturers' Association

Secretaries: Peat, Marwick, Mitchell & Co.
Telephone: (0742) 751234
Telex: 54170
Telegrams: Veritatem Sheffield

P. O. Box 121,
The Fountain Precinct,
1 Balm Green,
SHEFFIELD,
S1 3AF.

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Prof. Dr. A. Hildebrandt
Bundesgesundheitsamt
Postfach 330013
D-1000 Berlin 33
West Germany

10th May, 1985

Dear Professor Hildebrandt,

Enclosed are the NATEC microbiological results previously mentioned to you. In the event, these results do not reflect the common experience in retail distribution of fresh meat, which is that flexible PVC is superior to any polyolefinic film so far available for stretch-wrapping.

We were initially at a loss to explain the differences between academic studies conducted at Kulmbach and NATEC on the one hand and commercial experience on the other, even allowing for adequate oxygen permeability of the polyolefinic films.

The difference, we now believe, lies in a combination of pack to meat volume ratio and in the large difference in water vapour permeability rates between flexible PVC and polyolefinic films. In the NATEC work, the meat was at all times out of contact with the films. We believe the same was substantially true of the Kulmbach work.

In commercial practice, meat placed upon a paper or expanded polystyrene tray and overwrapped with film will result in a wide variety of pack profiles, many of which have the film in contact with the upper surface of the meat. Such packs also have little free volume between film and the sides of the meat.

The result is that exuded fluids are trapped between meat surface and film. In the case of contact with polyolefinic films, the water vapour permeability of which is low - see attachment No. 1 - water activity of the meat (commonly designated a_w) remains in the region of 1.00. At this level of a_w , all spoilage bacteria can multiply.

In the case of meat packaged with flexible PVC film whose water vapour permeability is five times higher than that of polyolefinic films, we surmise that the a_w falls the small amount needed - $a_w = 0.91 \sim 0.95$ (see attachment No. 2) to drastically reduce the growth rate of spoilage bacteria. The effect is enhanced by the fact that the permeability of liquid water through flexible PVC is about 20% higher than that for vapour alone, whereas values for polyolefines are independent of the nature of the water phase.

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The performance in the NATEC report of the flexible PVC film formulated with polymeric plasticiser replacing part of the DOA (sample B2 or II), coupled with its only slightly reduced water vapour transmission rate (76 vs 94 gm/m² 24 hrs) leads us to believe that such a film may also perform adequately in most cases - certainly better than polyolefinics. Its migration rate into meat would also be significantly lower than from traditional films.

We would remind you also that the particular suitability of flexible PVC in commercial terms based upon physical properties such as cling, elasticity, clarity, puncture resistance and general pack appearance remains an important factor. You have agreed that users' opinions should be established "on neutral ground" as recorded in your Minutes of the meeting 27th February 1984. We shall be pleased to co-operate in this.

Yours faithfully,

Prof. Howard Mitchell, Jr.

Secretaries