Factors influencing participation rates and employees’ attitudes toward promoting healthy eating at blue-collar worksites

Anne Lassen1*, Maria Bruselius-Jensen1, Helle Mølgaard Sommer2, Anne Vibeke Thorsen1 and Ellen Trolle1

Introduction

In public health policy, the accumulation of risk factors among groups with a short education is a challenge [1]. In Copenhagen, Denmark, life expectancy was found to be 7.4 years longer for 30-year-old men with a high educational level compared with those with a low level [2]. At the same time, short education has been associated with both physical inactivity and unhealthy eating, which are factors linked to increased risk of a number of illnesses, including obesity, cardiovascular diseases, many forms of cancer and Type 2 diabetes [3–6]. Therefore, there is a great need for population-based strategies to improve food habits with emphasis on reducing socioeconomic disparities [6–8].

In terms of environmental interventions aiming at promoting healthy habits among adults, available data suggest that worksites and universities have the most potential for success [9]. However, according to prior reports, blue-collar workers are less likely to participate in worksite health promotion programs than white-collar workers [10]. Sorensen et al. [11] conclude that methods to encourage worker participation are much needed. Obstacles in participation in health promotion activities among employees include a range of structural barriers, for example time to participate, production conflicts and shift work [11, 12], as well as aspects like resistance to breaking old habits, a perception that wellness programs are contrary to their work culture (the ‘macho’ factor) or skepticism about management’s commitment to improve worker’s health [13, 14]. Additionally, many people perceive food intake and their overall health as a personal issue [15, 16].

In order to enhance the possibility of employee participation in worksite promotion activities, it is vital to involve employees in defining the problems and in the planning process to resolve the problems [17, 18]. This is in line with the health promotion concept of World Health Organization, which is based upon several principles, and participation (involvement) is mentioned as one of the most important ones [19]. Employees and others are requested to participate in the development, implementation and evaluation of health promotion programs directly affecting their living and working conditions.

The present ‘Food at Work’ study was conducted as a partnership between the General Workers’ Union in Denmark, mainly organizing unskilled workers, the National Health Agency and a research institute. The aim was to investigate opportunities and impacts of promoting healthy eating in blue-collar worksites both with and without cafeterias. Results indicated that the study was successful in changing self-reported food habits and in decreasing the fat content in cafeteria served meals in the intervention worksites (A. Lassen, S. Fagt, A. V. Thorsen, H. M. Sommer, J. S. Andersen and E. Trolle in preparation). The specific objective of the present paper is to examine factors associated with the outcomes of the study with focus on (i) the number and kind of nutrition-related activities employees being aware of, participating in and at the

1Department of Nutrition and 2Department of Epidemiology and Risk Assessment, Danish Institute for Food and Veterinary Research, Søborg, Denmark
*Correspondence to: A. Lassen.
E-mail: ann@dfvf.dk

© The Author 2006. Published by Oxford University Press. All rights reserved. doi:10.1093/her/cyl153
For permissions, please email: journals.permissions@oxfordjournals.org
same time satisfied with and (ii) the employees’ attitudes toward promoting healthy eating at the worksites, including the role of the union representatives.

**Methods**

**Study design**

A brief overview of the study design and description of the cohort is presented in the following; further details will be presented elsewhere (A. Lassen et al., in preparation). Eight worksites were selected by the General Workers’ Union and included in the study. The worksites have all been nominated as ‘worksites of the year’ by the Union itself, and hence assumed to have a good employee–employer relationship. The worksites representing different company types (i.e. production units, transport industry and park facilities) were randomly allocated to three groups taking into account the presence or absence of a cafeteria; an intervention group without worksite cafeterias (I, two worksites), an intervention group with worksite cafeterias (IC, three worksites) and a minimal intervention control group (C, three worksites, two with cafeteria and one without). Data collection at baseline was made prior to randomization into groups.

Project groups were established at each of the worksites consisting of at least one union or workers safety representative, one manager representative, the cafeteria manager (if any) and other relevant participants. Following baseline data collection, a one-day ‘kick-off’ seminar was held for all members of the eight worksites’ project groups. The purpose was to inspire, to share experiences and to network among the participating worksites as well as to develop strategies for the project. Monthly during the intervention period of 6 month, the overall project team distributed a news magazine to all worksites that highlighted achievements at the worksites. The project group at each worksite was responsible for placing the news magazines in areas accessible to the employees. The intervention worksites (I and IC) were offered two kinds of handouts materials; specially designed nutrition quizzes and dinner mats; the themes being fruit and vegetables, fat intake and individual recommended servings illustrated as a plate model. Also, the overall project team repetitively encouraged the project groups at the intervention worksites to start promoting healthy eating habits, and the cafeterias in the IC group to develop the personnel’s competences in order to make the healthy food choices easier and more tempting. Monthly phone calls were made to the union representatives from the intervention worksites to check out how the activities were running. At least one support visit was conducted during the intervention period for each intervention worksite. The worksites themselves were responsible for initiating and implementing activities to achieve a high level of local project ownership.

A wide range of health strategies was developed individually by the project groups at the intervention worksites, including establishing kick-off events for the employees, worksite fruit schemes, taste demonstrations, setting up healthy lunchtime clubs, increasing availability of tasty, healthy choices in the worksite cafeterias and different types of information and dialog-based nutrition activities. The worksites in C group were asked to preferably wait to initiate nutrition-related activities to the period following the end point. At that point, the worksites in the C group would be offered help from the overall project group to initiate nutrition-related activities. Nevertheless, two worksites in the C group started fruit schemes for certain groups of the employees during the intervention period already.

**Employee interviews**

Employee interviews were conducted following a structured questionnaire by trained interviewers at baseline and at end point to a selected cohort at the employees. The union representatives were asked to select 25–30 employees, preferably members of the General Workers’ Union, to participate in the survey. The employees were chosen at random from lists covering the whole workforce and all occupational categories. At one of the worksites in the C group (i.e. a transport company), the number of individuals selected was lower than planned because of difficulties in reaching the number of
employees at the worksite. In order to avoid weakening of the design due to less people participating, the number of interviews at the other worksite from the C group was increased. Since the unit of analysis is the worksite, this bias in selection is accounted for in the model (see Data analysis and statistic section).

Across the eight worksites, 229 individuals participated in the baseline interviews and 201 completed both baseline and end-point interviews, corresponding to a dropout rate of 12%. There were some differences between groups, as the individuals of the IC group and of the C group were predominantly males (76 and 67%, respectively), had an average body mass index (BMI) of 26.1 ± 4.1 and 26.0 ± 4.1, respectively, and an average age of 44 ± 9 and 41 ± 10, respectively, whereas the I group was dominated by women (62%), had an average BMI of 24.9 ± 4.6 and an average age of 42 ± 8 (A. Lassen et al., in preparation). Furthermore, worksites in the I group had fewer employees compared with worksites in the IC group. Employees were interviewed individually at baseline and end point on the subjects of background variables, habits and attitudes toward food eaten at the worksite, behavior, knowledge and attitude toward healthy food, questions relating to the dietary record, dietary motivations and finally general health. The questionnaire at end point also included employee perception of the project. Data of five questions were selected as representatives of the employees’ attitude and perception of involvement. The questions could be answered on a four-point scale and only one category could be chosen when replying. Two of the questions were posed both at the baseline and at the end-point survey and rest of the five questions were only posed at the end-point survey. In addition, as an indicator of program awareness and program participation, employees were asked the following questions: Over the past half-year, have any nutrition-related activities been offered at your worksite? (i.e. assisted: nutrition quizzes, news magazines and dinner mats and unassisted: the rest). If ‘yes’, have you participated in the activities? If answered ‘yes’, are you satisfied with these activities? The answers ‘yes, to a high extent’ and ‘yes, to some extend’ counted as satisfied.

Key actors’ interviews
Semi-structured qualitative interviews were conducted individually at end point face to face with preferably three members of the project groups from every worksite; the union and manager representative, respectively, as well as the cafeteria manager (if any) or another member of the project group being in charge of the implementation of the activities. The interviewer did not meet the informants before the interviews but knew the course of the project. A total of 23 key informant interviews were conducted, each lasting ~30 to 60 min focusing on several themes including the motivations to join the project, motivations and barriers on its way, dealing with both personal and worksite-related matters, the implemented activities at the worksites and the perspectives afterward. The interviews were tape recorded for later transcription. All interviews were coded by the interviewer using the framework of grounded theory [20]. Only a small part of the analysis is included in this article. The quotations are added to present the results with the voice of the participant. The quotations are in line with the general findings in the themes.

Data analysis and statistic
The employee interviews consisted of several questions. Data from the questions on the employees’ participation in nutrition-related activities were aggregated and no statistical analysis was carried out on these data. However, data of the five questions selected as representatives of the employees’ attitude and perception of involvement were statistically analyzed using the software program SAS Enterprise Guide. Only employees that completed both the baseline and the end-point survey were included in the analysis. The actual observation is an aggregated table of all the individual answers from a given worksite to a given time (baseline or end point). Based on the structure of the observations, it is assumed that the data follow a multinomial distribution with ordinal structure. A proportional odds model with overdispersion and
a cumulative logit link function was chosen to describe the experimental design. The cumulative logits were linked to a linear predictor, which describes several effects: the effect of the categories, \( a_k \), of the different groups, \( g_t \), of the time of measurement, \( t_j \), of the distribution of sex of the participants at a worksite, \( s \), of the average age of the participants at a worksite, \( a \) and the effect of the average BMI of the participants at a worksite, \( b \). \( a \) and \( b \) are continues variables. The statistical analysis for each of the five questions started with a full model and was reduced successively as insignificant factors were removed from the model:

\[
\text{cum \_log \ it}(j_{k,t,g}) = \log \frac{P(Y \leq k \mid t, g)}{P(Y > k \mid t, g)} = a_k + g_t + s \cdot x_1 + a \cdot x_2 + b \cdot x_3,
\]

where \( k \) is an index for the categories of answers \((k = 1, ..., 4)\), \( i \) is an index for the groups \((i = \text{IC}, \text{I}, \text{C})\) and \( j \) is an index for the time of measurement \((j = \text{baseline, end point})\). \( s \), \( a \) and \( b \) are covariates of sex, ages and BMI, respectively. Before testing for significant factors, two pre-tests were carried out in order to test for the proportional odds assumption and to test for the goodness of fit of the model. The test for proportional odds assumption was performed by a score test, and the test for the goodness of fit of the model was performed by the deviance statistic. A level of significance of 5% was chosen.

As mentioned above, only employees who completed both the baseline and the end-point survey were included in the statistical analysis for questions in Table II, hence the data set consists of paired data, which is not accounted for in the model. If accounted for the paired structure in the data set, the \( P \) values in the test of significant effects would most likely have resulted in slightly smaller values.

For all five models (one for each question), the assumption of proportional odds could be accepted. For questions in Table II, the goodness of fit test, however, indicated that there was more variation in the system than could be explained by the models. This overdispersion could not be explained by adding the interaction term time \( \times \) group in the models for the questions in Table II, since this interaction term in these models was insignificant. The overdispersion is most likely explained by the intra-worksite correlation meaning that employees at the same worksite have a tendency to respond more alike than employees from different worksites. Explaining the overdispersion by the intra-worksite correlation is reasonable since the effect of the worksite is significant, or more precisely the nested effect ‘worksite (group)’ is significant when modeled as a fixed effect. The effect of ‘worksite’ alone could not be tested due to the hieratic structure. This nested effect, worksite (group), is a stochastic effect. In the framework of experimental design, the worksite (group) acts as blocks, and hence a possible worksite effect might be modeled as a random effect, as an overdispersion [21]. The overdispersion is modeled by introducing a dispersion parameter, \( \varphi \) in the model. It is important to account for the overdispersion, since the \( P \) values from the test statistics of effects are influenced hereof.

### Results

#### Employees’ participation rates

The activities at each worksite developed very differently as they were adjusted to the setting of each worksite. Figure 1 shows the number of activities that each employee had been aware of, participated in and had participated in and at the same time had been satisfied with during the intervention period. Data are shown for each of the I, IC and C groups separately. All over, the values are higher in the I group than in the IC group and in the IC group compared with the C group. Each employee participated in averagely 3.2 and 2.1 activities in the I and IC groups, respectively, compared with 0.9 activities on average in the C group (not shown).

Table I shows the results on employees’ attitudes toward the three types of activities that the project provided in intervention worksites, as well as results on the employees’ attitudes toward fruit programs introduced by two of the intervention worksites. Data for the two intervention groups I and IC are here shown combined. For all the activities at least every second of the employees reported to be aware
of the activity, albeit the degree to which the activities were being used and at the same time were being viewed positively varied widely. The news magazines and nutrition quizzes got the lowest scores (26 and 16% positive responses, respectively), whereas the dinner mats perceived a higher score (43% positive responses). In regard to the fruit programs, most of the employees that took advantage of the fruit programs (75%) also expressed being satisfied with the arrangement (73%).

Employees’ attitudes and perception of involvement

At baseline, 81% of the total group of respondents (n = 229) reported that they think their worksite should take part in promoting healthy eating among the employees (to a high or some extend, not shown). At end point, the number of positive expressions toward this question had significantly increased (Table II). For all groups, the estimated possibility (measured in odds ratio) to obtain a good manifestation was nearly twice as high at end point compared with baseline. The C group was not significantly different from the other two groups concerning the increased value of positive responses, since the interaction term time × group was not significant. The levels of a positive response in the three groups are significantly different (Table II). The I group did not agree to the same extend that the worksite should promote healthy eating as employees in the IC group or in the C group (P = 0.03 and P = 0.01, respectively, from odds ratio test not shown). The effects of sex, s, age, a and BMI, b were not significant for this question.

Significant increases in positive answers from baseline to end point were also seen regarding how often the employee debate food-related issues with their colleagues at the lunch break (Table II). Likewise, the change to receive positive response increased depending on the sex distribution; female employees being more likely to debate food-related

![Fig. 1. The number of nutrition-related activities that employees are being aware of (A), participating in (P) and at the same time satisfied with (S) at end point in the intervention group without cafeteria (I), in the intervention group with cafeteria (IC) and in the minimal intervention control group (C), respectively; Percentage reply in category 4+, 3–4, 1–2 and 0 number of activities, respectively.]

<table>
<thead>
<tr>
<th></th>
<th>News magazines (%)</th>
<th>Nutrition quizzes (%)</th>
<th>Dinner matsa (%)</th>
<th>Fruit programb (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(N = 5, n = 126)</td>
<td>(N = 5, n = 126)</td>
<td>(N = 4, n = 106)</td>
<td>(N = 2, n = 52)</td>
</tr>
<tr>
<td>Awareness</td>
<td>55</td>
<td>61</td>
<td>82</td>
<td>79</td>
</tr>
<tr>
<td>Participation</td>
<td>36</td>
<td>25</td>
<td>69</td>
<td>75</td>
</tr>
<tr>
<td>Satisfied with</td>
<td>26</td>
<td>16</td>
<td>43</td>
<td>73</td>
</tr>
</tbody>
</table>

The answers are collected for all of the worksites applying the activities (N = number of worksites applying the activity, n = number of employees interviewed).

aOne intervention worksite did not apply this activity. bUnassisted question.
issues at lunch breaks than men. There were no significant differences between the groups. Age, $a$, and BMI, $b$ were not significant for this question either.

On average, 71% of all respondents strongly or partly agreed that health activities make them feel appreciated (Table III). The change to receive positive response increased with both higher percentage of female employees and with employees having a higher BMI, but decreased with higher age. There were no differences between the groups. Moreover, regarding employees’ attitudes toward the Food at Work project, on average 97% of all respondents at end point viewed the program positively (strongly or partly agree with the question). In this case, no significance was found for any of the variables considered (Table III), which were group, sex, age and BMI. The perception of involvement among the employees in the project was generally high, on averagely 80% strongly or partly agreed on the statement. Only the variable sex, $s$, showed a significant effect. The higher the percentage of female employees, the larger the change of receiving a positive response.

**Key actors’ involvement**

The key informant interviews showed that the involvement of the key actors was of major importance to how the projects developed at the different worksites. The role of the management representative was in most cases to make way for the project at the worksite. Many of the key actors stated that it was supportive for the project to have a management representative, even thought the management did not initiate and completed the activities. In general, either the cafeteria representatives or the union representatives were the major driving force at the worksites.

The union representatives at all worksites had a central role in the start-up of the project. The union representatives estimated the interest from the management, the cafeteria manager and other relevant actors. Furthermore, the union representatives had an organizational role, acting as a connecting link between the project groups at the worksites and the overall project team. Finally, the union representatives all acted as ambassadors to the project. None of the union representatives claimed that the role as an ambassador was conflicting the role of being a representative for the Union.

It did not seem as a problem to me personally. The project is set about in such a way that we do not act as policemen (Union representative, IC group).

At worksites with cafeterias, the cafeteria manager had a tendency to ‘take over’ the project and

### Table II. The employees’ attitude at baseline (B) and at end point (E) to the worksite participating in promoting healthier eating and the perception of how often food-related issues is debated at the lunch break

<table>
<thead>
<tr>
<th></th>
<th>Intervention group without cafeteria (I)</th>
<th>Intervention group with cafeteria (IC)</th>
<th>Control group (C)</th>
<th>Significant variables</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>E</td>
<td>B</td>
<td>E</td>
</tr>
<tr>
<td>Do you think that the workplace should take part in promoting healthy eating?</td>
<td>n = 52</td>
<td>n = 73</td>
<td>n = 75</td>
<td></td>
</tr>
<tr>
<td>To a high extend (%)</td>
<td>35</td>
<td>48</td>
<td>50</td>
<td>65</td>
</tr>
<tr>
<td>To some extend (%)</td>
<td>29</td>
<td>46</td>
<td>41</td>
<td>33</td>
</tr>
<tr>
<td>To a minor extend (%)</td>
<td>23</td>
<td>10</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Not at all (%)</td>
<td>13</td>
<td>0</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>How often do you talk (debate) food-related issues at the lunch break?</td>
<td>n = 50</td>
<td>n = 70</td>
<td>n = 67</td>
<td></td>
</tr>
<tr>
<td>Very often (%)</td>
<td>20</td>
<td>26</td>
<td>9</td>
<td>26</td>
</tr>
<tr>
<td>Often (%)</td>
<td>26</td>
<td>44</td>
<td>30</td>
<td>32</td>
</tr>
<tr>
<td>Sometimes (%)</td>
<td>48</td>
<td>26</td>
<td>45</td>
<td>31</td>
</tr>
<tr>
<td>Never (%)</td>
<td>6</td>
<td>4</td>
<td>16</td>
<td>11</td>
</tr>
</tbody>
</table>

The employees’ attitude at baseline (B) and at end point (E) to the worksite participating in promoting healthier eating and the perception of how often food-related issues is debated at the lunch break.
run the different activities. This was seen not only in relation to the menus in the cafeterias but also with regard to other activities as start-up campaign and distributing materials.

At worksites without cafeterias, the union representatives were generally more active compared with union representatives at worksites with cafeterias. Also, the social aspects in relation to the activities played a bigger role in the worksites without cafeterias. The union representatives established a connection to relating areas at the worksites such as work environment and health care. Both union representatives at the worksites without cafeterias claimed that a cultural change had taken place regarding food during the study.

Now, it is accepted to bring a bowl of salad for lunch. Before the project, it would be commented as ‘rabbits food’ (Union representative, I group).

In regard to the projects’ one-day joint kick-off seminar, many of the key actors mentioned that the project groups at the worksites benefited by participating in this seminar and that it gave the group a strong foundation to set up activities at the worksites.

### Discussion

This Food at Work intervention study aiming at improving the diet of employees in blue-collar settings showed large differences in employee participation rates depending both on worksite characteristic and on the specific activity. Worksites without cafeterias were associated with greater employee awareness, greater participation in and satisfaction with the project activities as reported on the employee survey compared with worksites with cafeterias. Other studies have suggested that employees in smaller companies are more likely to participate in health promotion programs than employees of large companies, but they have only limited access to them [10, 17, 22]. Likewise, the worksites without cafeterias in the present study were smaller compared with the worksites with cafeterias. In smaller companies, information can

---

Table III. The employees' attitude at end point (E) toward health-related activities at work, toward the Food at Work project and the employees' perception of involvement in the project

<table>
<thead>
<tr>
<th>Interventions</th>
<th>Intervention group without cafeteria (I)</th>
<th>Intervention group with cafeteria (IC)</th>
<th>Control group (C)</th>
<th>Significant variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health-related activities at work make me feel more appreciated as an employee</td>
<td>n = 47</td>
<td>n = 71</td>
<td>n = 71</td>
<td>P values</td>
</tr>
<tr>
<td>Strongly agree (%)</td>
<td>36</td>
<td>34</td>
<td>35</td>
<td>Sex: 0.005</td>
</tr>
<tr>
<td>Partly agree (%)</td>
<td>40</td>
<td>35</td>
<td>35</td>
<td>Age: 0.038</td>
</tr>
<tr>
<td>Disagree (%)</td>
<td>15</td>
<td>13</td>
<td>14</td>
<td>BMI: 0.025</td>
</tr>
<tr>
<td>Strongly disagree (%)</td>
<td>9</td>
<td>18</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>I am over all satisfied that the worksite participates in the Food at Work project</td>
<td>n = 52</td>
<td>n = 74</td>
<td>n = 73</td>
<td></td>
</tr>
<tr>
<td>Strongly agree (%)</td>
<td>83</td>
<td>81</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td>Partly agree (%)</td>
<td>17</td>
<td>15</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Disagree (%)</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Strongly disagree (%)</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>I feel that the employees have been involved in the Food at Work project</td>
<td>n = 51</td>
<td>n = 68</td>
<td>n = 71</td>
<td></td>
</tr>
<tr>
<td>Strongly agree (%)</td>
<td>65</td>
<td>46</td>
<td>49</td>
<td>Sex: &lt;0.001</td>
</tr>
<tr>
<td>Partly agree (%)</td>
<td>25</td>
<td>24</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>Disagree (%)</td>
<td>8</td>
<td>15</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Strongly disagree (%)</td>
<td>2</td>
<td>16</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>
spread more easily and smaller companies tend to have a greater sense of community than larger [22]. For larger companies, it may be beneficial to engage more employees in the project groups at the worksites or include the formation of employee advisory boards as in the Treatwell 5-a-Day Worksite Study [23] or peer education as described by Buller et al. [24].

Three types of information activities were provided by the Food at Work intervention study. Of these, the dinner mats with nutritional messages had the greatest appeal on the target group. Probably not only on account of their simple messages but also because of their presence at every table in the cafeteria, they were hard to miss, and was subject to a debate on health and nutrition. Therefore, the dinner mats have a degree of interactivity and works as a part of a social context. Almond [25] suggests on the basis of focus groups with blue-collar workers that information presented through an interactive intervention may be easier to recall than non-interactive sources such as television or magazines, and Irvine et al. [26] demonstrated the potential for interactive multimedia programs to impact eating habits positively of employee populations. Campbell et al. [27] suggested that audiovisual elements rather than print are more effective for those with limited literacy skills. Results of the present study also showed that a great employee participation and satisfaction were seen in relation to activities creating a bigger availability of healthy food. Almost everybody participating in a worksite fruit program was satisfied with that activity.

Overall, a significant positive change in employee attitude was seen from baseline to end point toward the worksite promoting and implementing healthy eating. Furthermore, a majority of the employees agreed that health-related activities made them feel appreciated by the worksite. Many factors may have played a role in the positive attitude. The perception of connection between smoking and occupational exposures has been shown to determine the interest in participation in activities aiming at quitting smoking. However, the perception of a connection between diet and occupational exposures may be weaker than that for smoking and occupational exposures [28]. It is notable that the degree of the participation in activities in the present study did not seem to greatly influence the answers to the posed questions concerning attitudes toward health-related activities at work. Independent on the degree of the participation between the three groups, the increases in positive answers were the same. One should though bear in mind that the lack of significance between groups is no evidence of absence of differences. The participation in activities is properly not the only explanation for the increase in positive response from baseline to end point. Other matters might influence including the overall design of the study making the employees in the minimal intervention control group positive toward the project as well as positive toward the activities they assume will be activated the following period (after the end point).

The present results showed that employees’ perceptions of involvement in the project were generally high, and the fact that the union representatives played a key role in the project may have contributed to this. Since unions represent the interest of the employees, cooperative relations with the unions are likely to be seen as caring for the well-being of the employees [29]. The role of the union representatives may be multifaceted in supporting the process of worksite health promotion and may include assuring the employees’ view, promoting positive attitudes toward the project, pressing for a plan and completion of activities and finally activating the participation of the employees it represents. In addition, the union representative may contribute to make a connection to other work environment initiatives and encourage the integration of social elements in the activities. One union representative expressed that his role was strengthened by the fact that he did not have to act like a policeman. Participation was regarded as optional and the nutrition messages in the present study focused on developing healthy eating habits and pleasure derived from eating, rather than on losing weight. The project was designed in order to create a positive attitude toward healthy eating and lifestyle and as a basis for opening the lines of communication about food and health at the worksites. In fact, a
significant increase in positive answers was seen in the present study regarding how often the employee debate food-related issues with their colleagues at the lunch break. Also, each worksite was given a high extend of self-determination in the project to complete the project’s activities in order to achieve a high level of local project ownership and to ensure that activities were adapted to the specific character of each worksite. This may be another important factor explaining the high rating of acceptance among the employees.

The union representatives seemed to be more active in the worksites without cafeteria compared with the worksites with cafeterias. At worksites with cafeteria, the cafeteria managers had a tendency to take charge of the project and run the different activities. This may imply that the potential of the union representative has not been fully exploited. The role of the union representative may be strengthened through education and network formation to improve self-confidence and effectiveness when initiating and implementing the desired changes [30]. This study experienced that the joint kick-off seminar gave a good foundation to all key actors to set up activities at the worksites.

Several study limitations should be stated including the small sample sizes as well as differences in background variables between groups as the worksites rather than individuals were randomized in the study. Moreover, we do not exactly know how many of the employees initially selected by the union representatives refused to participate in the interviews. However, our impression from the union representatives was that only a few employees refused to participate, since the interviews took place during working hour and were supported by both the union and worksite management. Finally, the number of participating worksites is too limited for broader generalizations, and clearly the presence of a cafeteria is associated with other variables like the size of the worksites. Therefore, it is not possible to attribute the findings of the present study solely to the presence or absence of a cafeteria since it is confounded with the size of the worksite.

The overall finding from the present study shows that, under given conditions, employees at blue-collar worksites in general have a positive attitude toward the worksite promoting and implementing healthy eating at the worksites and that the degree of the positive attitude can be increased over the project period. In general, women responded more positively than men. The study emphasizes the potential of engaging unions in worksite health promotion. It is suggested that participation of union representatives in the project groups at the worksites had created a positive effect on the workers’ perception of the project and a feeling of involvement among the workers. The study showed large differences with regard to the level of worker’s awareness, participation and satisfaction with the nutrition-related activities depending both on the worksite characteristic and on the specific activity. The findings of the present study should be taken into consideration when planning future nutrition intervention strategies aimed at employees in blue-collar worksites.

Acknowledgements

The authors would like to thank all those who took part in the project, especially the staff and managers at the eight worksites and the overall project team members Hans Dankert from the General Workers’ Union in Denmark and Susanne Walter Rasmussen from the Danish Veterinary and Food Administration. We also thank Jens Strodl Andersen for the initial data management work and the statistical support and the following for their guidance and support along the way: Hanne-Jette Hinsch, Jens Kofod, Margit Groth and Inge Tetens, all from the Danish Institute for Food and Veterinary Research.

Conflict of interest statement

None declared.

References

A. Lassen et al.


Received on February 9, 2006; accepted on October 8, 2006