

COVERAGE AND CONTENT ANALYSIS OF BIOTECHNOLOGY AND GENETICALLY MODIFIED ORGANISMS IN FOUR SELECTED NIGERIAN DAILY NEWSPAPERS

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ABSTRACT

The media, especially the newspapers play a major role as sources of biotechnology information and will be useful avenues for disseminating related information. It is in view of this that this study examined coverage of biotechnology and Genetically Modified Organisms (GMOs) in Nigerian daily newspapers as an avenue to raise mass awareness especially amongst literate farmers. This study content analysed 63 GMOs and biotechnology items framed in four Nigerian newspapers (the Guardian, Punch, Vanguard and Nigerian Tribune). The time frame was from January 1, 2005 to December 31, 2010 being the period that marked the sudden rise in public awareness of biotechnology issues occasioned by coverage of biotechnology related news in Nigerian media. Variables measured include types of news, frequency of news coverage, placement, direction and space allotted to biotechnology news and related stories. Data were analysed using both descriptive (frequencies, percentages) and inferential (ANOVA) statistics at $p \leq 0.05$. Results indicate that across the four newspapers, types of biotechnology news reported were mostly food safety news (54.0%) in 2005 (21 items) with highest news items from Tribune (49.0%). Though most news items (87.3%) on GMOs and biotechnology were positively framed, all (100%) news items were not strategically placed as they were in other pages of all the newspapers. Space allocated to biotechnology news was higher in the Punch (469cm²) than Guardian (423 cm²), Tribune (378 cm²) and Vanguard (252 cm²). There were significant difference across the newspapers in direction ($F = 1.23, p \leq 0.05$) and space allotted ($F = 2.53, p \leq 0.05$) to coverage of biotechnological news. Generally, there is low reportage of biotechnology and GMOs news for the period investigated, across newspapers, in space allotment and strategic locations; it is therefore recommended that more attention and priority should be accorded biotechnology news items in terms of space and strategic placement to enhance public awareness of related information.

Key words: Biotechnology and GMOs news, Nigerian newspapers, News coverage, Content analysis

INTRODUCTION

Throughout the past decades, biotechnology has awakened at once the imagination and concern of scientists, governments, politicians, businesses, and citizens alike. The public controversy surrounding biotechnological applications emerged in the 1990s. One way to increase understanding in these kinds of technological controversies is to analyze media reporting on biotechnology. The media play a critical role in the public's understanding of new developments in science, such as in the genetic engineering of food products for human consumption. They set the boundaries of debates around scientific issues (Nelkin, 2005), frame scientific problems and solutions for the public (Ten Eyck, Thompson and Priest, 2001),

and specifically for the field of biotechnology, play a role in the perceptions of risk and benefit (Bauer, Durant and Gaskell, 2002). The lack of direct experience that the majority of the public has with genetics and biotechnology means that news coverage is a strong influence on these subjects (Nelkin, 2005), and "it is very likely that the power of media to influence public opinion is stronger for science and technology issues than for other questions" (Priest, 2001).

In Africa and by extension, Nigeria, agriculture is characterised by the production of late maturing crops and animals with pests and diseases, low yielding varieties of crops, low nutritional value crops among others. This has led to continuing decline in food production, re-

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sulting in food insecurity and poverty. Biotechnology is aimed at combating these entire problems which includes food production of early maturing crops and animals, drought resistant crops, pest and disease resistance crops, high yielding variety and enhanced nutritional value. Public awareness through newspapers is therefore germane to target the public especially farmers, consumers and others stakeholders on biotechnology and genetically modified organisms issues. However, in Nigeria, little attention devoted to issues of biotechnology and genetically modified organism started effectively at the turn of the millennium in year 2000, gained further prominence five years later (2005) all through to 2010. During this period, though sparingly, newspapers with national spread carried biotechnology and genetically modified related issues.

In view of this, this study examined coverage of biotechnology and Genetically Modified Organisms (GMOs) in Nigerian daily newspapers from 2005-2010 as an avenue to raise mass awareness on the significance of biotechnology in solving food security problem. In specific terms, this study determined types of biotechnology and GMO news covered, the frequency of coverage of such news, the direction, prominence and space allotted to biotechnology and GMOs news in four selected Nigerian newspapers.

METHODOLOGY

Sample selection

The time frame of the study was January 1, 2005 to December 31st, 2010. This period represents the frame of time when the media especially the newspapers significantly started reporting biotechnology and GMO related issues in Nigeria. Four Nigerian daily newspapers that were in continuous publication during this period were purposively selected. The sampled newspapers were Nigerian Tribune, The Punch, The Vanguard and Guardian daily newspapers. A pre-test showed that the four selected daily newspapers report agricultural news routinely; and they were found to have allocated column for agricultural news. The

four selected newspapers were ranked among the top 50 Nigerian newspaper (online newspapers, 2010). Thereafter, selection of newspaper edition was carried out producing 63 articles across the four selected newspapers in the six-year period. Of the 63 articles selected, Nigerian Tribune accounted for close to 50% (31) articles while Guardian, Punch and Vanguard had 15, 9 and 8 respectively.

Unit of Analysis

A whole news item was the unit of analysis. A news item is any article which satisfies the study's definition of biotechnology and GMO and the content of which could be coded into one of the content categories developed. Content categories used by this study were adopted from Serageldin and Persely (2000). The categories were ethics, food safety, environmental risks, economic concentration, intellectual property management and general issues. Each of the newspaper editions within the time frame of the study were perused to select news items that falls in any of the identified categories.

Variables of measure

The following variables were measured for the purpose of this study.

Types of news: For the purpose of this study, types of news refer to the categories (ethics, food safety, environmental risks, economic concentration, intellectual property management and general issues) the news covered falls into.

Frequency of coverage of biotechnology and GMOs news: This is number of times GMO related news was covered in a year across the four newspapers investigated.

Direction of news: This deals with the positivism or otherwise of GMO news reported in the dailies. The news can either be positive or negative.

Prominence and space allotted: While prominence deals with the placement of the news

item or article in the newspapers, space allotment is the total space covered in the newspapers. Prominence in this study measured whether the news items are placed on the front, middle back or other pages of the newspapers.

Inter-coder Reliability

In order to ensure reliability of the data collected for the study, inter-coder reliability was carried out. Three coders (individuals) were used. The essence of the inter-coder reliability was to ensure consistence in the judgment of the three coders that were used for data collection (article selection) and coding into categories identified earlier in the unit of analysis.

The inter-coder reliability was calculated using Holsti (1985) reliability formula as stated below:

The reliability formula = $3M/N_1 + N_2 + N_3$
where

M = Number of agreement where coders agree in the classification.

N_1 = Number of articles coded by the 1st coder

N_2 = Number of articles coded by the 2nd coder

N_3 = Number of articles coded by the 3rd coder

Using the information above, Inter-coder reliability coefficient of 0.95 was obtained.

Data were analysed using descriptive (percentages and frequency counts) and inferential (ANOVA) statistical tools.

RESULTS AND DISCUSSION

Types of biotechnology and GMOs news in the newspapers

Table 1 reveals that the four selected newspapers reported more of food safety news (54.0%) than the other content categories like general issues (17.5%), environmental risk (15.9%), economic concentration (9.5%) and

ethics (3.2%) while no news was on intellectual property management. However, while proportion of specific coverage by newspapers does not differ from what was obtained in the overall picture, there were slight variations. For instance, while food safety news enjoyed overwhelming coverage across all selected newspapers, general issues (7.9%) and environmental risk (7.9%) were the second most attended news in the Tribune; Guardian had general issues (6.3%) and economic concentration (3.2%); the Vanguard dwelled on environmental risks (3.2%). The dominance of food safety issues in Nigeria's media may be a direct response to incessant outbreak of epidemic resulting from handling of food and food products hence, the need to sensitize the populace to the danger inherent in poor handling of food products.

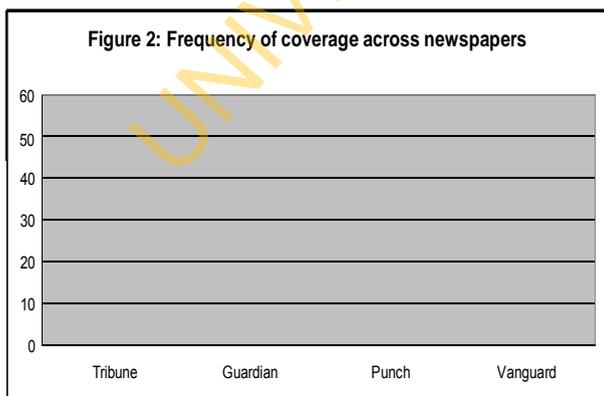
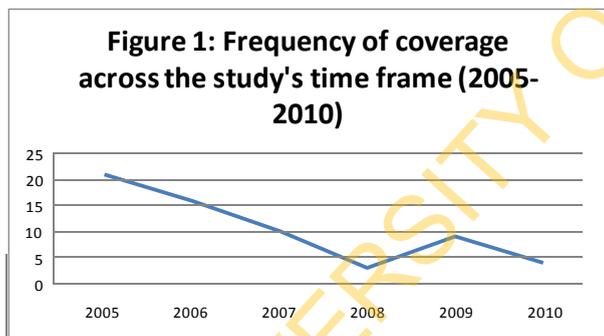
Table 1: Content categories covered in the four selected newspapers

Content categories	Tribune	Guardian	Punch	Vanguard	Total
Food safety	17 (26.9%)	8 (12.7%)	5 (7.9%)	4 (6.3%)	34 (54.0%)
General Issues	5 (7.9%)	4 (6.3%)	1 (1.6%)	1 (1.6%)	11 (17.5%)
Environmental risk	5 (7.9%)	1 (1.6%)	2 (3.2%)	2 (3.2%)	10 (15.9%)
Economic concentration	2 (3.2%)	2 (3.2%)	1 (1.6%)	1 (1.6%)	6 (9.5%)
Ethics	2 (3.2%)	0 (0%)	0 (0)	0 (0%)	2 (3.2%)
Intellectual Property Management	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	31	15	9	8	63

Frequency of coverage of biotechnology and GMOs news

Frequency of coverage of biotechnology and GMOs news in Nigeria's daily is presented in Figures 1 and 2. While Figure 1 paints the

picture of what obtained across years covered in this study, Figure 2 presents the coverage across the newspapers. While the coverage was most in 2005 (21 items), it dwindled through 2006 (16 news items) and 2007 (10 news items) and was least in 2008 (3 items). It however rose to 9 news items in 2009 and fell again in 2010 with 4 items. For specific coverage in newspapers, Nigeria Tribune had the highest of 49.0% of the news item while Guardian, Punch and Vanguard had 24.0%, 14.0%, and 13.0% respectively. These findings indicate low frequency of biotechnology and GMOs news both for the period investigated and across newspapers. This is in line with observations of Sitton (2001) who observe that despite the relevance of agricultural information to farmers and objectivity enjoyed by agricultural news, little or no attention has been given its coverage while daily coverage is few. Summarily, the set of results implies that coverage of news on biotechnology and GMOs are not being given adequate attention by the Nigerian newspapers.



Direction of biotechnology and GMOs news

Table 2 indicates two ways (positive and negative) biotechnology and GMOs news were in the news items reviewed. While there was generally more positive (87.3%) than negative (12.7%) news across the selected newspapers, proportionately, the Guardian covered more negative (6.3%) than Tribune (3.1%) that had 46.0% positive news as well as Punch and Vanguard (1.6%). The Punch and Vanguard had 12.7% and 11.0% positive news items respectively. This implies that the newspapers were generally favourably disposed to the biotechnology news making the headlines across the globe. The earliest period covered in the survey equally marked the gradual emergence of biotechnology and GMOs issues in Nigeria, hence the dedication of more positive news items by the print media, perhaps to promote GMOs. This is in tandem with the position of most media scholars who had emphasised the pace setting agenda of the media in issues as topical as biotechnology and GMOs (Nelkin; 2005 and Priest; 2001).

Table 2: Directions of biotechnology and GMOs news in the selected news papers

Directions	Tribune	Guardian	Punch	Vanguard	Total
Positive	29 (46.0%)	11 (17.5%)	8 (12.7%)	7 (11.0%)	55 (87.3%)
Negative	2 (3.1%)	4 (6.3%)	1 (1.6%)	1 (1.6%)	8 (12.7%)
Total	31	15	9	8	63 (100.0%)

Prominence of Biotechnology and GMOs news

The result of prominence of biotechnology and GMOs news enjoyed in Nigeria’s media is as shown in Table 3. It is evident that all news items on GMOs and biotechnology were

in other pages of all the newspapers in this study. This means that biotechnology and GMOs were not considered very important despite its effect on health and environment. These findings suggest that technological advancement and agricultural revolution do not really occupy a prime place in Nigeria's newspapers. Media hype in Nigeria's daily normally revolves around issues like politics, economic, sports and entertainment. This much was reported in past studies (Olowu and Yahaya; 1993 and Omofonmwan and Osa – Edoh; 2008) with unanimous submission that coverage of rural development news that contributes to agricultural production by newspapers journalists is abysmally low. However, Fawole and Olajide (2012) reported fair deal for agricultural related news like climate change as more climate change news was strategically placed in the front and back pages of newspapers. The newness of the GMO and biotechnology issues and perhaps lack of sponsoring agency could be attributed as possible causes of low patronage it enjoyed in the period covered in this study.

Table 3: Prominence of biotechnology and GMOs news in the selected newspapers

Newspapers	Front Page	Middle Page	Back Page	Other Pages
Tribune	-	-	-	31(49.0%)
Guardian	-	-	-	15(24.0%)
Punch	-	-	-	9(14.0%)
Vanguard	-	-	-	8(13.0%)
Total	-	-	-	63

Space allotted to Biotechnology and GMOs news

Data on space allotted to GMOs and biotechnology news is as presented in Table 4. Space allotted by Punch (469 cm²) accounted for about one-third (31.0%) of the total spaces in the six-year period of the study. The Guardian, Tribune and Punch allotted 423 cm², 378 cm² and 252 cm² respectively. If this is compared with results obtained in total news items, the Tribune had the least amount of space allotted to the biotechnology and GMOs

news. Whereas the Tribune reported close to half of the news items, the items occupied least spaces compared with Punch and Guardian that accounted all together for less than 40 percent of the total news items. The plausible deduction one could make out of this is that perhaps, the Punch and Guardian had more feature articles, columnists' submissions and editorial opinions while Tribune had more of news flash on GMOs and biotechnology.

Table 4: Space allotted to Biotechnology and GMOs news in the selected newspapers.

Newspapers	Amount of space allotted in cm ²
Punch	469(31.0%)
Guardian	423(28.0%)
Tribune	378(25.0%)
Vanguard	252(16.0%)
Total	1522 (100.0%)

Test of differences in frequency of coverage, direction and space allotted to Biotechnology and GMOs news in the selected newspapers

The result on test of difference in frequency of coverage, direction and space allotted to biotechnology and GMOs news was as shown in table 5. Whereas there was no significant difference in the frequency of coverage of biotechnology news in the newspapers ($F=1.89$, $p \leq 0.05$), there were significant difference in direction ($F=1.23$, $p \leq 0.05$) and space allotted across different newspapers ($F=2.53$, $p \leq 0.05$) to coverage of biotechnological news. The result of the frequency of coverage implies that the four selected Nigerian daily newspapers covers almost equal amount of Biotechnology and GMOs articles in agricultural news. In a similar study by Hoban (2001), he noted that mass media have been selective in their coverage of Biotechnology, more interested in politics than science, simplicity rather than complexity and danger rather than safety.

For space allotted and direction, the results is pointer to the fact that the selected Nigerian daily newspapers did not allot equal amount of space to Biotechnology and GMOs news and cover more positive than negative news. The trends in this set of results (space and direction) are evident in the results of the descriptive statistics reported in this study. These findings suggest that there is a variation in the importance attached to biotechnology and GMOs among the different newspapers. This variation may be attributed to researchers not making research available or the orientation or background of the reporting journalists.

Table 5: Difference in the frequency of coverage, direction and space allotted to Biotechnology and GMOs news in the selected newspapers

Variable	Df	Mean square	f value	p value	Decision
Frequency of coverage	5	1.814	1.894	0.110	Not Significant
Direction	3	0.139	1.245	0.0301	Significant
Space allotted	8	2.175	2.539	0.020	Significant

CONCLUSION AND RECOMMENDATION

From the foregoing, it is concluded that there was low reportage of biotechnology and GMOs news both for the period investigated and across newspapers. Emphasis of most reportage was on food safety than general issues and other types of biotechnology news. Also, while prominence enjoyed by GMOs news is minimal in spite of its effects on health and environment, most of the news items were on positive notes. Space allotted was equally small for the numbers of years covered in this study. Based on these, it was recommended that:

1. Given the importance of biotechnology news, more attention and priority should be accorded biotechnology news items in terms of space and strategic locations.

2. Also, other frames like environmental risks, economic concentration, intellectual property rights and general issues should also be accorded due coverage.

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